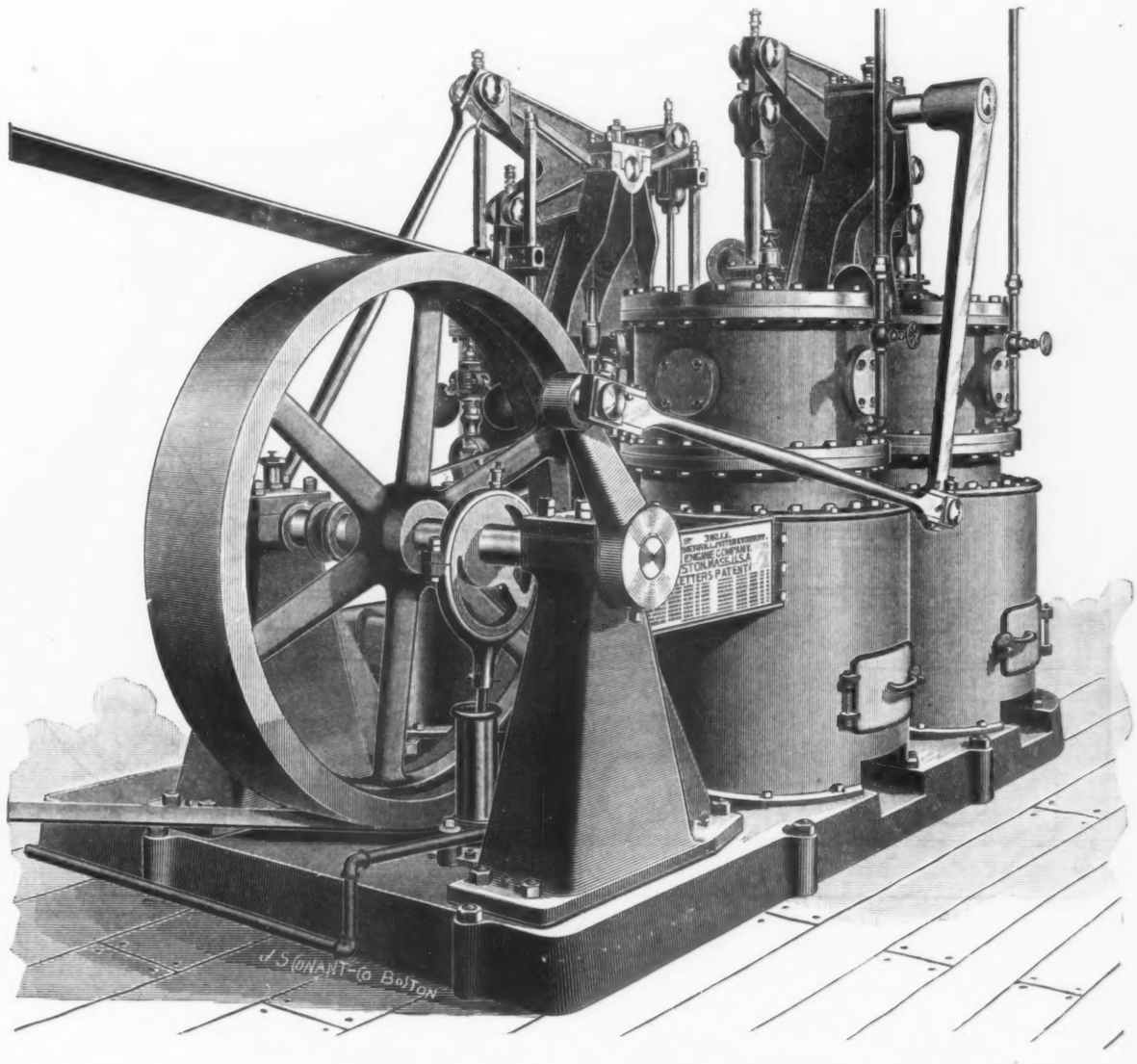
THE IRON AGE

THURSDAY, SEPTEMBER 26, 1889.

A New Hot-Air Engine.

The air-engine of which we herewith present engravings has developed exceptional efficiency according to tests made by George H. Barrus, of Boston. In concluding his report Mr. Barrus states that "in view of the very large improvement that has already been made in the economy of the engine, and in view of the evident losses which have been referred to, which are still going on, it seems quite probable that an engine of this type can be made which will develop an indicated horse-power on a consumption of 1 pound of coal per hour, measuring the coal during a period beginning with the fires in a normal condition and ending with the fires in the same condition."



THIRTY-FIVE HORSE-POWER AIR-ENGINE, BUILT BY WOODBURY, MERRILL, PATTEN & WOODBURY.

The general form of the engine and most of its details are represented by the accompanying engravings, Fig. 2 being a side elevation, Fig. 3 a plan and Fig. 4 a sectional and elevation through the centers of the working cylinders on one side. The engine consists of two working cylinders, which are double-acting, and two "reverser cylinders," so called, all of which operate through beams and connecting rods upon the same fly-wheel shaft. The bottom ends of the No. 1 reverser and No. 1 cylinder are connected by a pipe; so, also, the bottom ends of No. 2 reverser and No. 2 cylinder are likewise connected. The top of No. 1 reverser is connected by a pipe with the top of No. 2 cylinder, and the top of No. 2 reverser with the top of No. 1 cylinder. There is a furnace beneath each reverser, and the flue from this furnace passes to a chamber surrounding the bottom of the working cylinder and thence to the chimney. Fig. 4 shows the arrangement of the principal parts. The furnace, heater and reversing cylinder are shown to the left, one above the other in the order named. The regenerator is below the cooler, both of which surround the reverser cylinder. The working cylinder is shown to the right. The only communication between the upper end of the reverser cylinder and the lower end of the same—that is, between the cold end and the hot end—is through the passages which form the regenerator and cooler. When the reverser piston moves downward, the air which is contained in this cylinder passes out of the space at the bottom, up through the regenerator and cooler, into the space left at the top; and when the reverser piston moves upward, the air in the upper part of the cylinder returns first through the cooler, then through the regenerator, and finally into the space below the piston. The air in the reverser cylinder is, by this means, brought into alternate contact with the heater at the bottom and with the cold space at the top, and it is consequently alternately heated and cooled as the reverser piston works up and down. On its passage through the regenerator the air gives up its heat to the material of which the regenerator is composed, and when the air returns through the regenerator it picks up the heat previously given up. Being thus alternately heated and cooled, the air in the reverser cylinder, which has no outlet excepting through the pipe leading to the working cylinder, has its pressure alternately increased and decreased by an amount proportional to the range of temperature. Now, if we suppose that the reverser piston and the working cylinder piston are so connected by the mechanism that the working piston is made to move upward when the reverser piston is at the

top of its stroke and downward when the reverser piston is at the bottom of its stroke, it will readily be seen that the working piston will be subjected to the high pressure on the upward stroke and to the lower pressure on the downward stroke, and this difference of pressure will enable a working force to be generated. The reverser piston, having both sides in open communication with each other, is in substantial equilibrium, with the exception of the resistance due to the passages in the regenerator and cooler.

The reverser piston answers the purpose of a valve for the working cylinder, and its simple office is to transfer the air from the hot part of the chamber to the cold part and thereby to secure the desired increase and decrease of pressure. The object of the cooler, which is simply a tubular apparatus through which the water circulates, is to deprive the air of the heat which the regenerator fails to absorb and utilize. This sketch shows in a simple way the principles on which the engine works. The engine is made double-acting by employing two sets of these cylinders and by connecting them together by piping, as shown in the drawings, so that at the beginning of the stroke of either working piston, in either direction, one side of the piston will be in communication with the hot end of one reverser and the other side with the cold end of the opposite reverser.

The regenerator consists of an annular space 3¾ inches wide and 16 inches high, the outside diameter being 29 inches and the inside diameter 21½ inches, which is filled with wire-gauze. This gauze is made of wire No. 25 B. W. G., which is about $\frac{1}{50}$ inch in diameter, 12 meshes to the inch each way, and it is placed in the regenerator in such a way as to completely fill the space. It is wrapped spirally around the center cylinder, and there are 102 courses. The amount of the superficial area of this gauze before it is introduced is approximately 1900 square feet. Each cooler consists of 640 tubes, made of copper, 18 inches long, $\frac{9}{32}$ inch inside diameter, and No. 20 B. W. G., this last corresponding to a thickness of 0.035 inch. The air passes through the inside of the tubes, and the water which is used for cooling circulates around the outside. The tubes are held by means of heads 1¼ inches thick, and the amount of surface exposed to the air between the heads is 60.8 square feet on each side.

The engine is fitted with a governor, shown in drawing Fig. 2, which is of the ordinary centrifugal type. It acts upon a valve that opens communication between the top ends of the two working cylinders. The crank which drives the reverser pistons during the test above referred to was set about 70° ahead of the crank which is driven by the working pistons. The relative positions of the reverser pistons and working pistons at different points in the stroke was determined by turning the engine over by hand and drawing a short vertical line with the indicator-pencil at four points, namely: 1, When the No. 2 piston was at the beginning of the down-stroke; 2, when it was at the end of the down-stroke; 3, when the No. 2 reverser was at the top, and, 4, when the No. 1 reverser was at the top. Measuring the distances of these marks from each other, it is found that the No. 1 reverser is at the top of the stroke when the No. 2 piston has moved over 56 per cent. of its down-stroke, and the No. 2 reverser is at the top of its stroke when the No. 2 piston has moved over 40 per cent. of its down-stroke.

The draft of the chimney for the engine is regulated by hand, a damper being placed in the flue leading from each furnace. The engine is arranged so that it can be worked at any desired initial pressure of the air, a pressure-tank being provided, which is kept supplied with air by means of a small air-compresser, which is worked by an eccentric on the main shaft, shown in Figs. 1 and 2. The diameter of the cylinder of this compressor is 4 inches and its stroke 6 inches, and it is single-acting. The dimensions of the pressure-tank are—diameter 24 inches, length 5 feet. This engine is built for a working pressure in the tank of nominally four atmospheres—that is, 45 pounds by the gauge; but it has been worked for a short time at a pressure in the tank of five atmospheres. It is claimed that there is no limit to the pressure which can be carried in the machine, except that which relates to the strength of the parts. The pressure in the tank is that of the lowest pressure in the engine, corresponding to the back pressure in the ordinary steam-

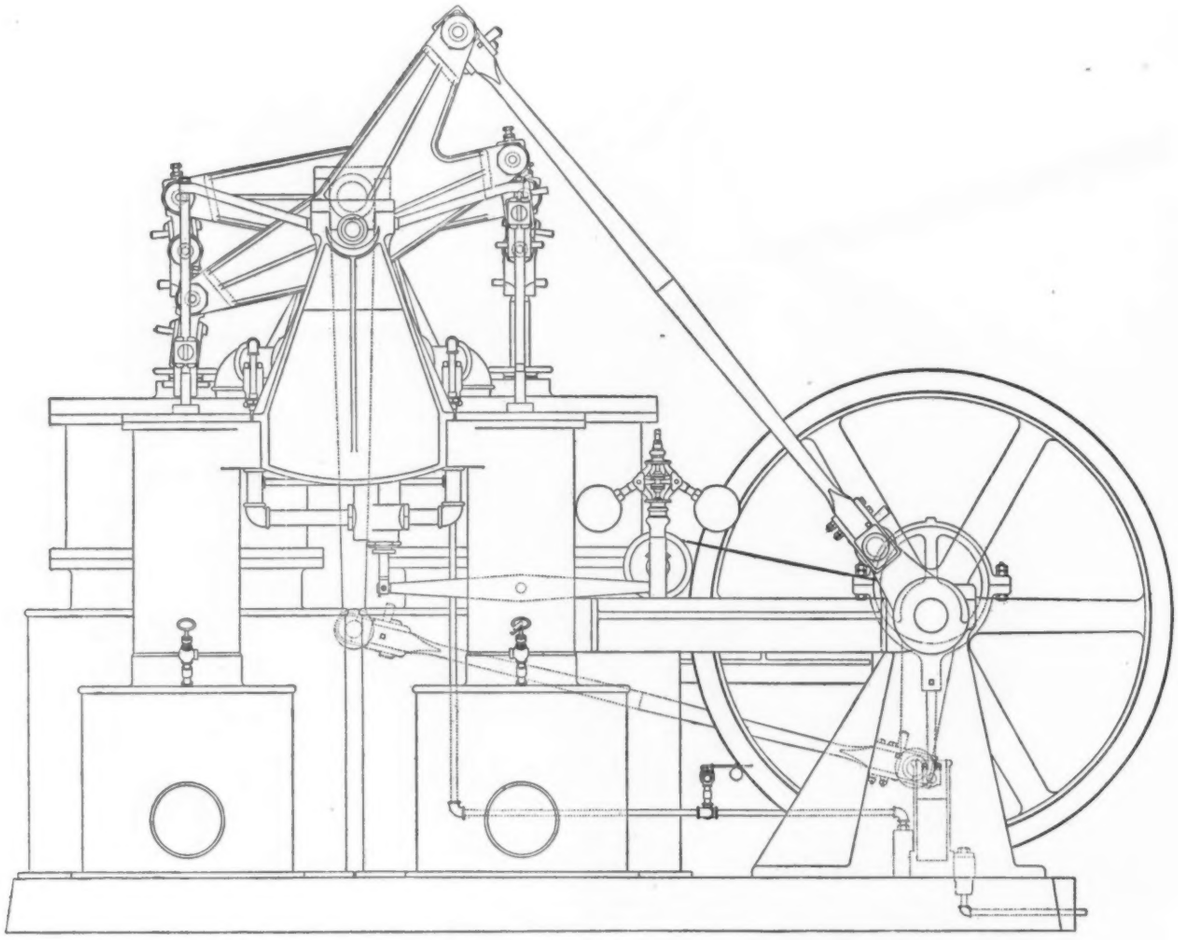


Fig. 2.—Side Elevation.

THIRTY-FIVE HORSE-POWER AIR-ENGINE.

engine, and the heating of the air serves to carry the highest extreme of pressure above this point. The pistons of the engine for all the cylinders are packed with simple cast-iron ring packing, each set out with springs. It will be noticed by referring to Fig. 4 that the pistons of both cylinders are very deep, the packing being located on the top, and this provision is made so as to keep the rubbing-surface of the packing as far as possible away from the hot end of the cylinder. The lubrication of the cylinder is effected by means of cylinder-oil in the manner of ordinary steam-engines, though the oil requires to be pumped into the cylinders rather than fed automatically.

The furnaces are lined with fire-brick, and beyond this there is no protection against radiation, all the cylinders and exterior of the furnaces being bare. The engine which was tested—that is, the No. 13—occupies a floor-space of 7.1 x 11.6 feet. The extreme hight over all is 10 feet and the weight is 12 tons.

In our opening paragraph we quote Mr. Barrus' opinion regarding the possibilities of the engine. We quote as follows from his report: "The results of these tests show that the engine is capable of transmitting through the belt an effective horse-power for not more than one-half of the coal required for the best steam-engines of small power which are commonly used, the assumption being made that ordinary engines of this size use about 5 pounds of coal per indicated horse-power per hour and about 6 pounds per brake horse-power. These results do not appear to be the best that can be obtained from this type of engine, for there is a considerable loss of heat from the unprotected exterior surfaces of the furnaces, due to radiation, which might easily be prevented by the use of suitable covering. There is also loss from the exterior surfaces of other parts of the engine, from the same cause, which might also be prevented. It is believed, also, that the engine is capable of giving better results with some changes in the proportions. This opinion is offered for the reason that the present engine is so far in advance in the matter of economy of fuel over a previous engine, which the writer tested several years ago."

This engine is built by the Woodbury, Merrill, Patten & Woodbury Air Engine Company, of Boston, Mass.

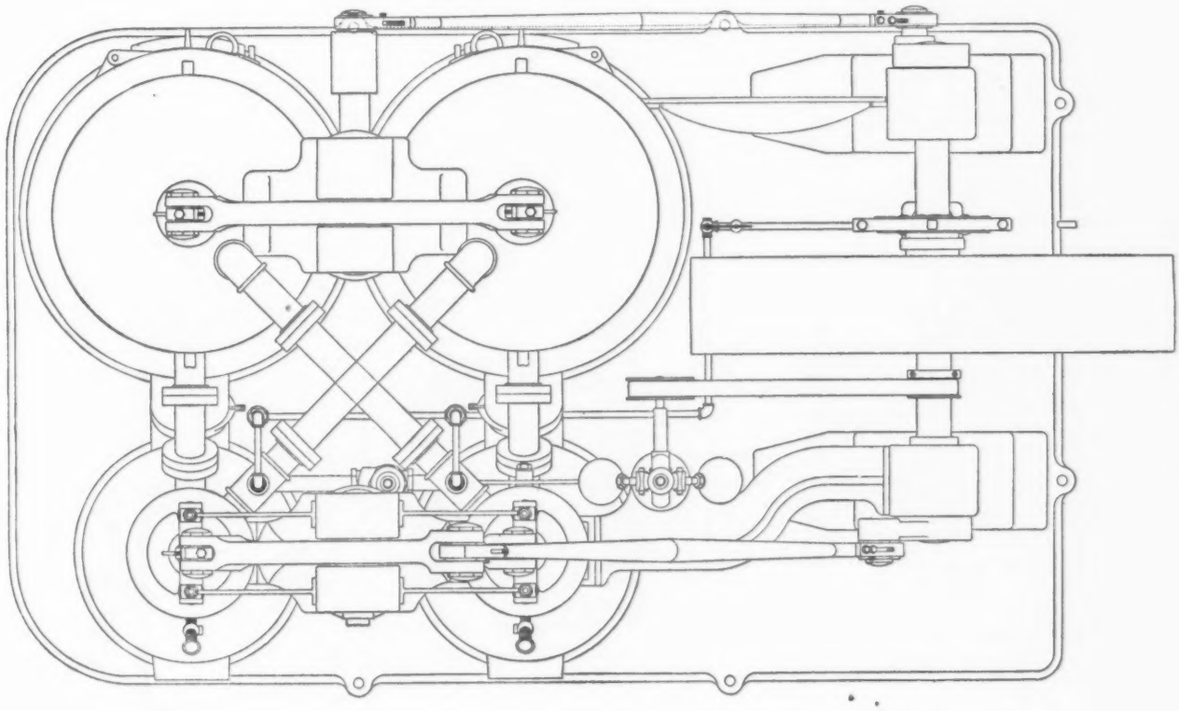


Fig. 3.—Plan.

THIRTY-FIVE HORSE-POWER AIR-ENGINE

The New Norfolk Dock.

The new Simpson dock at Norfolk, Va., is 530 feet over all, and will take a vessel of 430 feet in length of keel, 26 feet 6 inches draft, and in width will take anything now afloat. The depth of water at the entrance to the dock at high water will be 26 feet 6 inches, and at low water will be 23 feet 8 inches, the rise and fall of the tide at the navy-yard being 2 feet 10 inches. The average depth of the southern branch of the Elizabeth River, which forms the approach to the new dock, is about 35 feet at high water, and this will allow the largest ships of the navy to come up at any time. The site of the dock, which is near the southern end of the yard, was chosen on account of the width of the river at the point and its close proximity to the various shops of the yard. The axis of the dock lies about northwest by southeast, and it is protected on three sides from heavy gales, which makes it possible to dock a vessel in the roughest weather. The dock when full holds about 8,000,000 gallons of water, and at the official inspection of the dock by the board, headed by Capt. F. M. Bunce, United States Navy, it was emptied in the short time of 1 hour, 5 minutes and 26 seconds. The two centrifugal pumps were built by the Southwark Foundry and Machine Company, of Philadelphia. They have an average capacity each of about 52,000 gallons per minute. The contract for the building of the dock specified that these pumps should have a capacity of 40,000 gallons, but the test shows them to be largely above this figure.

The foundation of the dock is piling, over which, to the depth of 3 feet, is a solid bed of concrete. Above the concrete floor the dock is of wood, and 1,000,000 feet of Georgia heart-pine and almost as much other timber was used in its construction. Where any of the timber is exposed to the salt water it was creosoted to prevent it from the destroying attacks of the toredo worm. The caisson which closes the mouth of the dock is an iron structure ribbed and riveted like a modern cruiser, and it is worked with water ballast. There are eight feeding valves and culverts through it, and by them the dock has by actual test been flooded to a depth of 25 feet in 55 minutes. All of the bilge blocks are operated from the top of the dock. The sides of the dock, which are constructed with steps which have 8 inches rise and 10 inches tread, makes shoring easy. This dock is 100 feet shorter than the one recently constructed at Newport News for the Chesapeake Dry Dock and Construction Company, but the other dimensions are about the same, while the one opened at the Norfolk yard has the advantage in the ease with which large vessels may be docked, and also in the depth of the water which forms the approach.

This is the first of the three dry-docks contracted for with the Government by J. E. Simpson & Co., and its completion before any of the others is due to the favorable conditions of climate which have allowed the work to progress throughout the winter months almost without interruption. The docks constructed to this date by J. E. Simpson & Co. are three at Boston, which have been working ever since 1856 and have only had $5000 spent on them in repairs since completed; two at Brooklyn, N. Y., completed in 1864; one at Wilmington, Del., and owned by the Harlan & Hollingsworth Company; one at Philadelphia, owned by the Messrs. Cramp; one at Baltimore, owned by the Baltimore Dry Dock Company; the one at Newport News, and one at St. Johns, N. F.,

owned by the colonial Government, which was completed in 1884, and no repairs have been made on any of them except those at Boston. Almost alongside of the Simpson dock lies the stone dry-dock which was completed in 1833 after six years and a half of work at a cost of $974,356.65, and which in length is only 300 feet. This gives a very fair chance for a comparison of the cost of the two classes of docks, the Simpson dock, 530 feet long, costing only $495,707.57 and being completed in just 22 months from the time of the signing of the contracts.

A Famous Lumber Barge.

The barge Wahnapitae, Capt. William Patterson, left Duluth lately with the largest lumber cargo ever carried by any vessel. She was built in Bay City, Mich., in 1836, for the Emery Lumber Company for the purpose of carrying logs. Her length over all is 270 feet and beam 51.5 feet. In the United States vessel register her gross tonnage is 1431.54, net 1359.97. Her molded depth is 11.9 feet. She has B1 rating and an insurance valuation of $35,000, although she cost $53,000. Her owners soon took her out of the log trade, because while she was a success she could make a great deal more money carrying lumber, ties, telegraph poles, &c., and an idea of her money-making capacity may best be obtained from a glance at the following list of cargoes carried while in command of her present captain, William Patterson, who has been on her since the opening of navigation last year:

Cargo.	Amount.	Gross Earnings.
Lumber	2,000,000 feet	$4,000
Railroad-ties	44,069	3,966
Lumber	2,000,000 feet	5,000
Coal	1,800 tons	1,260
Lumber	2,000,000 feet	5,000
Telegraph-poles	10,000	6,800
Telegraph-poles	10,000	6,800
Block stone	1,800 tons	3,600
Lumber	2,000,000 feet	6,500
Railroad-ties	40,000	3,200
Railroad-ties	40,000	3,200
Railroad-ties	40,000	3,200
Lumber	2,042,000 feet	4,084
Lumber	2,042,000 feet	4,594
Lumber	2,600,000 feet	5,850
Fifteen cargoes; total gross earnings		$67,054

Previous to these two seasons she had once or twice carried 2,500,000 feet of lumber out of Duluth harbor, and the largest cargoes she has ever carried, 49,069 ties and over 2,500,000 feet of lumber to-day, were into and out of Duluth. Here is a large vessel earning considerably over her cost in two seasons, without losing a single item of cargo, a record unequaled by any vessel in the general-commodity trade. She has had no mishaps to speak of beyond a slight grounding, and also being cast adrift while her tug ran to the shelter of the Apostle Islands for safety. It was a severe test for any vessel, that hard storm last year, and this great craft weathered it well. With her small cargoes of coal and stone, as shown in the foregoing table, she drew, with the former, 9 feet 3 inches of water, even keel; with the latter, 10 feet 2 inches aft and 9 feet 3 inches forward, and she can carry over 3000 tons on less draft than any other vessel on the lakes can carry 2000 tons.

At a meeting of the business men of Wheeling, W. Va., held on Thursday, the 19th inst., nearly $12,000 was subscribed for the purpose of making a thorough test for natural gas in that city or immediate vicinity. Quite a number of manufacturing concerns in Wheeling who have been using natural gas piped for some miles have been compelled to return to the use of coal because the supply of gas was inadequate. It was then decided to raise some money and endeavor to get gas in Wheeling or vicinity. It is expected that drilling will be commenced in a short time.

A New Railroad Signal.

A successful test of a new automatic block railroad signal was made on the tracks of the Pittsburgh and Western Railroad, at Allegheny City, Pa., a few days ago. The signal is the invention of T. D. Williams and J. S. Luevek, two electricians in the employ of the Western Union Telegraph Company at Pittsburgh. To conduct the test a number of common block-signal poles were erected on both sides of the track, at regular distances, and exhibitions were made of all the different ways in which a train could protect itself. The first was a train on a single track displaying danger signals rear and front. When the train entered the block a steel brush which came in contact with an insulated piece of copper formed a circuit and weights in the poles were released by electricity, causing the danger signals to be displayed at either end of the block. In the same way a broken train on a single track was protected. Another test showed two trains approaching each other on a single track, each protected front and rear. The final exhibit was a train on a double track protected in the rear.

The entire apparatus works automatically. A small battery is carried on the locomotive and one is concealed near the foot of every pole. A wire runs from the battery in the engine to a steel brush, and one runs from the battery at the pole to a piece of copper about 4 feet long which is securely fastened near the outer edge and at a slight elevation above the rail. The brush coming in contact with the copper forms the current that releases the weight in the signal-pole and the board on top of the pole flies up. When it does so a bell in the locomotive tells the engineer that the signal has been displayed properly. The board remains in a horizontal position until the train reaches another block, when it falls to its old position, showing that the track is clear. The mechanism of the invention is simple and not likely to get out of order, but should anything happen a danger signal is displayed on the block where the trouble exists. Each block works independent of the other, and one being out of order does not interfere with the operation of the balance. Quite a number of railroad men and electricians witnessed the test and all were well pleased with it.

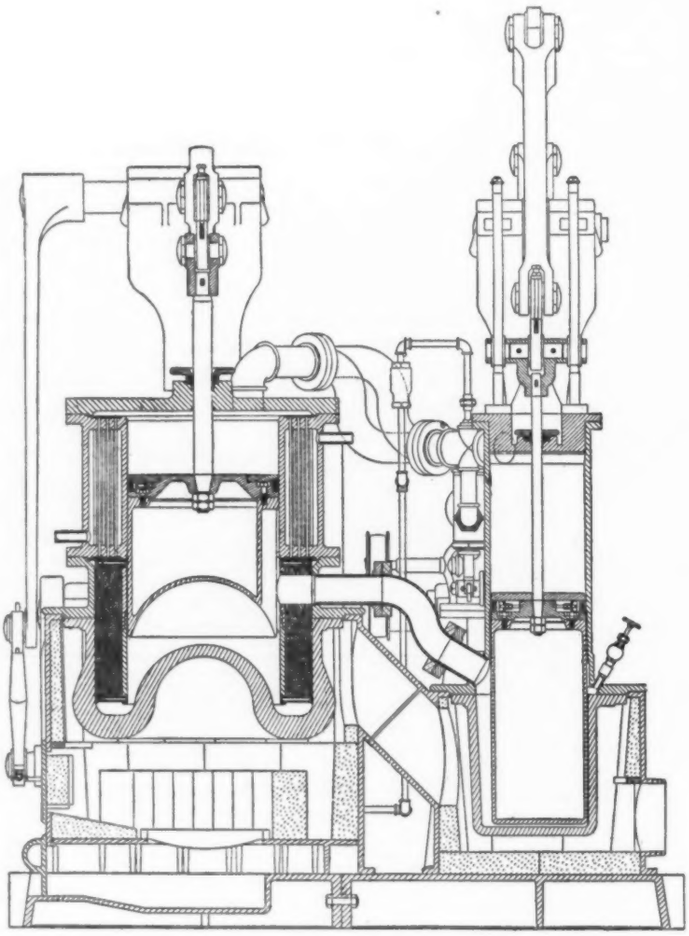


Fig. 4.—Vertical Cross-Section through Cylinders.

THIRTY-FIVE HORSE-POWER AIR-ENGINE.

The offices of the H. C. Frick Coke Company, of Pittsburgh, are about to be removed from their present quarters, at the corner of Fifth avenue and Smithfield street, to the new Hussey Building, in Fifth avenue, in that city.

The McClure Coke Company have purchased the Colonel Evans coal property of 2200 acres, near Uniontown, Pa., and will immediately erect new ovens.

The Cruiser Baltimore.

We have already mentioned the official trial of the cruiser Baltimore, built by Wm. Cramp & Sons. The engines were run at full speed for four hours, under the management of the contractors, the data being taken by naval engineers. The Baltimore has twin-screws, is 335 feet long over all, 48½ feet beam, and draws 19½ feet of water when fully loaded. On the occasion of the trial the steamer did not have her guns and stores, but was loaded to the same displacement as she would have shown if fully equipped. The designs of this steamer were obtained from England, and called for engines to develop 10,500 indicated horse-power. The Navy Department, in letting the contract, did not reduce the size of the engines, but only required the development of 9000 indicated horse-power, offering a bonus of $100 for each additional indicated horse-power developed during a trial of four hours. The trial was made with forced draft, on the closed fire-room system, the air-pressure varying from 2 to 2.7 inches of water. Picked coal (Pocahontas bituminous) was used in the furnaces. It is reported that the machinery worked well, with the exception of slight priming in some of the boilers, little water being used on the bearings. The official report of the trial has not yet appeared, but it is surmised that the average indicated horse-power was about 10,300, in which case the contractors will receive the substantial bonus of $130,000.

During the run the contractors were allowed 5 minutes in every 15 to fire and adjust the machinery, nothing being touched after each interval of five minutes until a signal was given, and during this time indicator diagrams were taken and observations made of steam pressure, vacuum, counter, &c. The following are the particulars of each hour's run:

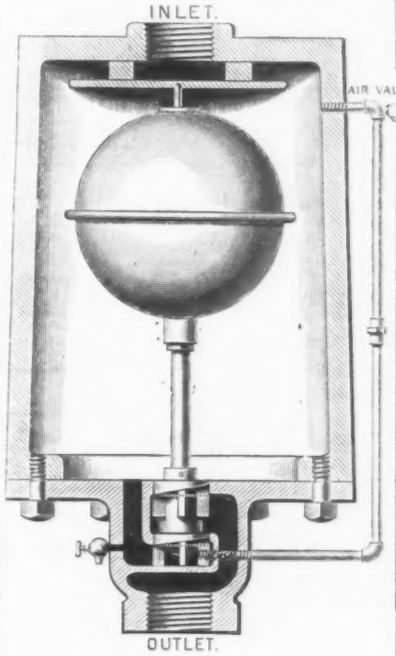
Hour.	Revolutions per minute.		Steam pressure, Pounds per sq. in. above atmosphere.	Probable speed, Knots per hour.
	Starboard engine.	Port engine.		
First	118.0	116.6	118.0	20.7
Second	118.6	119.4	120.5	21.1
Third	118.8	122.7	118.5	21.5
Fourth	113.7	113.7	109.0	20.2
Averages	117.3	118.1	116.5	20.9

The above speeds are calculated from the pitch of the screws (20 feet), making an allowance of 10 per cent. for slip, and may be modified somewhat in the official report. Some experiments on turning the vessel when going at full speed were made after concluding the speed trial. Using both screws the steamer turned in 6 minutes 58 seconds, and with one screw in 7 minutes 2 seconds, the diameter of the turning circle being 220 yards. When the engines were working in forward gear at full speed they stopped and reversed in 15 seconds.

Output of Gogebic Ore.—In an interview in the Duluth *Herald*, J. Parke Channing is quoted as follows concerning the Gogebic range: "All the leading mines are making good records, and the Norrie will beat any previous record. It looks now as if it would take out fully 575,000 tons. The Ashland will yield about 200,000 tons; the Aurora, as much; the Pabst, about 100,000 tons, and the Iron King, Brotherton and Hennepin, 75,000 tons each. There will be a total from this district of 1,750,000 tons in round numbers. I should estimate the yield in the Vermilion district at 1,000,000 tons, the Menominee at 1,500,000 tons and the Marquette at 2,750,000 tons, giving a total of 7,000,000 tons for these Northwestern iron districts this year. Some of our mines are shipping now by rail through all the winter months, and the Brotherton, in particular, has a contract for 25,000 tons to be delivered this winter. Ore rates now to Chicago and Milwaukee are down to $2 per ton."

Automatic Steam-Trap.

It is claimed that the trap we here illustrate will take care of the condensed water as fast as formed, without blowing steam or requiring a regulated steam-pressure. This end is attained by the use of a balanced valve placed in the steam-chamber and operated by a float. The valve is formed with annular flanges, the lower surfaces of which have inclined planes so as to open and close gradually



Blake Automatic Steam-Trap.

in the valve-chamber and thereby allow a steady flow of water. In case of an excessive flow the valve will lift high enough to give a double discharge of water through both parts in the valve-chamber. The pin at the top of the float is designed to guide and prevent the stem from bending during transportation. The dome in the top of the trap, directly under the inlet, deflects the water from the float. The waste-cock in the bottom can be used to clean the trap from scale or sediment deposited from the pipes without passing through the valve opening; it also provides a means of draining the trap of water. A waste-pipe from the air-valve into the discharge is arranged as shown. This trap is made by W. L. Blake & Co., of Portland, Maine.

Application was recently made to the Treasury Department for an allowance of drawback on the exportation of bent window-glass made from imported plain window-glass by the process of merely bending the imported sheets. The Department has decided that such articles are not entitled to drawback, on the ground that the bending referred to does not constitute a manufacture within the meaning of the law.

The Work of the Patent Office.

C. E. Mitchell, the Commissioner of Patents, has filed with the Secretary of the Interior the preliminary report of the operations of his bureau for the year ended June 30, 1889. There were received during the year 36,740 applications for patents, 808 applications for design patents, 101 applications for reissue patents, 1281 applications for registration of trade-marks, 772 applications for registration of labels, and 2345 caveats, making a total of 42,047. The number of patents granted in the year, including reissues and designs, was 21,518; number of trade-marks registered, 1111; number of labels registered, 312; making a total of 22,941. The number of patents withheld for non-payment of final fees was 2858; number of patents expired, 11,920.

The receipts from all sources for the year aggregated $1,186,557; the expenditures, including printing and binding, stationery and contingent expenses, $999,697; leaving a surplus for the year of $186,860, which makes the total amount in the United States Treasury to the credit of the patent fund $3,524,526. At the close of the fiscal year 1888–89 the business of the Patent Office, says the report, was in a satisfactory condition as compared with former years. The examinations of applications for patents carried on in 24 of the 30 examining divisions had been brought up to within two months of that date, and of the remaining six divisions one-half were less than three months in arrears. This is a satisfactory showing as compared with former years. The Commissioner believes, however, that the arrears in work in all the divisions can be practically done away with at an early date through the cordial co-operation of the force with the efforts of the Commissioner.

The Commissioner says that an opinion has found expression that the policy of the Patent Office in adjudicating upon questions arising in the granting of patents should conform more nearly to the decisions of the Federal courts. There can be no doubt of this view, and accordingly the Commissioner believes it would be wise for Congress to require the clerks of the Federal courts to furnish certified copies of all decisions and opinions in patent cases for publication in the official gazette.

Windom and the Tariff.—Secretary Windom will have a considerable mass of valuable data upon which to construct a Tariff bill if he decides to lay one before Congress. He has called on the Collectors of Customs at New York, Philadelphia, Baltimore, Chicago and San Francisco for their opinions on necessary improvements, and in most cases has asked the opinions of the Surveyors and Naval Officers also. He has sent to each of these officers copies of the Mills Tariff bill and the Senate Tariff bill, and asked them to give their opinion on different sections regarding which they have special information, the advantages and disadvantages of specific, ad valorem and mixed duties, with special reference to the feasibility of imposing and collecting them, the practical effect upon importations and upon the revenue of the rates of duty in the two bills, and which of the provisions relating to administration are likely to prove most convenient and beneficial. Only one or two replies have thus far been received, although they have been requested before September 30. Secretary Windom has already begun the preparation of the general features of his report, and will soon take up the tariff features.

By a large majority the Common Council of Philadelphia have fixed the tax rate at $1.85.

Electric Traveling-Cranes at the Paris Exposition.

The *Engineer*, of London, describes and illustrates the 10-ton electric traveling-cranes which form such an interesting feature of the exposition. With the object of making all the working parts of the exposition as modern and attractive as possible, it was decided to operate the 10-ton traveling-cranes in the Palais des Machines by means of electricity. The practicability of this application of electricity has thus been visibly demonstrated, during the erection of the heavy machinery in the hall, to many who up to the present had not been able to investigate its utility, the interest being greatly furthered by the fact that cranes are worked on completely different systems, both as regards the dynamos and motors in use and the mechanical gear for controlling the different movements.

The position of the traveling-cranes and supporting girders, with respect to the span of the hall, is indicated in Fig. 1. There are four lines of girders extending the entire length of the building, which are supported on cast-iron posts 20 feet high, arranged in pairs as shown. On the top of the girders, at a hight of about 23 feet from the ground, the rails for the travelers are laid, and some 6 feet below these the main lines of shafting are supported by pendant brackets from the girders. The cranes each cover a span of 59 feet, and are indicated in the figure as they appear seen from the Labourdonnais, or northeastern end of the hall. The installation of that on the right-hand side has been intrusted to the engineering firm of Messrs. Bon & Lustremant, while the other, on the Ecole Militaire side, has been carried out by the firm of Messrs. Mégy, Echeverria & Bazan, engineers, both houses being of Paris.

A separate building erected in the motive-power court, outside the machinery hall, contains the generator plants for supplying both cranes with electrical power. The Gramme generator, supplying the Bon & Lustremant crane, is driven by belting direct off a 25 horse-power Westinghouse engine running at 375 revolutions, and is identical in all respects with the motor fixed on the crane. The current is led from this station by insulated cables underground to the Suffren end of the hall, where the cables are jointed to the bare solid copper conductors, running along the length of the track. These two conductors rest on the top of porcelain reel insulators, fixed along each side of one of the main rails on the girders, as shown in Fig. 3; the last pair of insulators at the distant end being attached to the girder through a screw adjustment for taking up the slack. It was originally proposed to work with a silicium-bronze wire, owing to its greater mechanical resistance to wear. A copper-stranded cable was, however, first laid down, but owing to the heavy continuous work to which the crane has been subjected since the opening of the exhibition in the carrying of passengers and the consequent exceptional wear of the strands, this has now been replaced by a No. 5 B. W. G. solid copper conductors.

The current is taken from the two lines of bare conductor by stout brass hooks hanging vertically from the under side of the body of the crane. The manner in which these are insulated by a wooden block will be seen in the figure, where it will also be observed that the hooks are fixed a little above the level of the porcelain reels, so that they not only pass clear of them, but lift up the conductors with a certain slight amount of strain sufficient to insure good contact. The electric generator and motor which are used for the working of this crane are of the improved Gramme type, and have been manufactured and supplied, together with other electrical accessories, by the Compagnie Electrique, whose works are in the Avenue Philippe-Auguste, Paris. The motor, which was calculated to be capable of supplying 12-brake horse-power, was before leaving the works subjected to brake tests of which the results were as shown in the table given above. One French horse-power being equivalent to 75 kg. m. per second, we have 900, exactly equal to 12 horse-power, and a mean mechanical efficiency for the three tests of 75 per cent. This was calculated for the heaviest load the crane would be required to raise —viz., 10 tons, which it has frequently lifted and even sometimes exceeded.

Test.	Ampères.	Volts.	Speed.	Brake power. Kg. per sec.
I.....	48	242	500	900
II.....	40	275	600	904
III.....	36	300	700	910

These details were kindly supplied us by M. Dehenne, director of the Compagnie Electrique. Now that passengers are carried, the weight is, of course, distributed; but allowing a moderate estimate of 11 stone per person, this adds to the weight of the crane by 8½ tons for 120 passengers, which is the average number. The net weight of the crane itself is 30 tons. During the performance of these journeys the motor runs at 750 revolutions, absorbing a mean current of 25 ampères. The length of track from one end of the hall to the other is about 320 m., or 1050 feet, and this distance is traversed in 11 minutes, giving a speed of travel of 95½ feet per minute. The current at starting is about 50 ampères, and the mean current during the run is from 25 to 27 ampères when moving toward the Suffren end, while it is a mean of 23 on the return trip. The motor and dynamo are both series wound, and a resistance is fitted on the crane to adjust in the main circuit. A Desruelles and Chauvin voltmeter, capable of reading up to 350 volts, is fitted to the resistance board, together with an ammeter, as shown in Fig. 3.

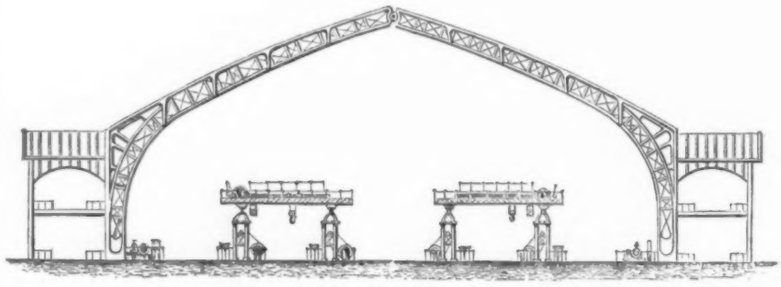


Fig. 1.—Position of Electric Traveling-Cranes.

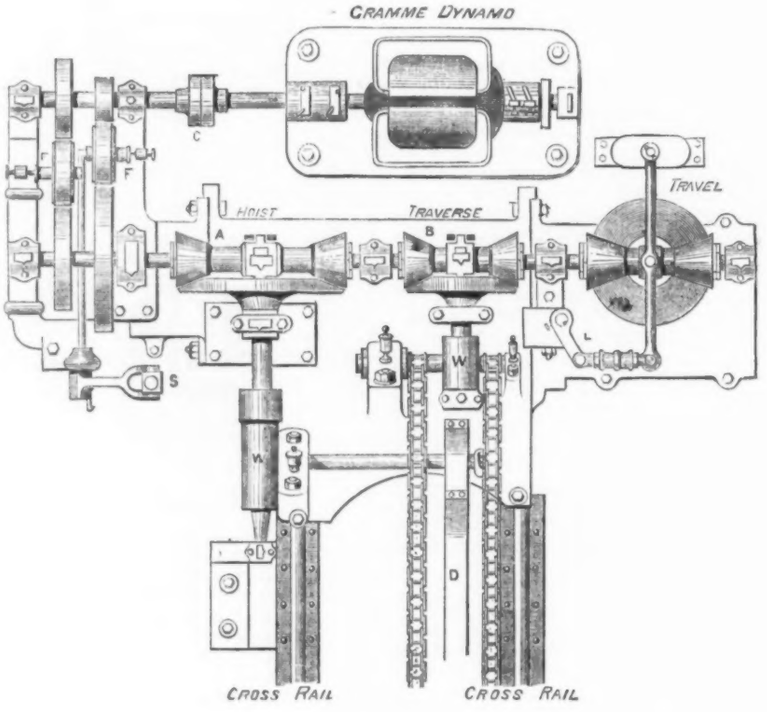


Fig. 2.—Plan.

THE BON & LUSTREMANT ELECTRIC TRAVELING-CRANE.

We may now discuss the mechanical gear for controlling the three different movements. (1) Travel, or the movement of the crane bodily along the track; (2) traverse, or the shifting of the burden across the span of the track, and (3) hoist, or raising and lowering the burden. By reference to the plan of the mechanism given in Fig. 2 it will be seen that the motor is coupled on to a short length of

shaft carrying two pulleys of different diameter. In line with these are two paper surface friction-pulleys, F F, which are each carried by a forked lever at either end of a lever pivoted at P, Fig. 4. Again, in line with these pulleys are two different-sized pulleys keyed on to the main power-shaft. A forked lever keyed to the other end of the pivot-spindle P carries a block between the fork-arms, into which a vertical screw, S, works. It follows, therefore, that when the screw is turned the forked lever is raised or lowered, and either of the two friction-wheels F F made to bear down upon the two contiguous pulleys, so making mechanical connection between them. This movement is performed from the working platform by the hand-wheel marked "speed," and by means of this gear the speed with which any of the three movements are accomplished can be altered in the ratio of 1 : 2. That is, the power-shaft can run at either one and one-half times or three times the speed of the motor-shaft. The slow speed is required in starting a heavy load, and the change in speed may be made when the movement is well under way, the gear being arranged so that contact must be made by one or other of the friction-pulleys.

The power-shaft lies parallel to the direction of the track and is fitted with three nests of friction-cones. Each pair of cones on the shaft is mounted on a sleeve in the ordinary way, which slides along a feather on the shaft and can be shifted one way or the other by a forked lever acting at the center of the sleeve. The three intermediate cones which take off the power from one or other of each pair of cones are larger in diameter, so reducing again the speed, and are keyed to shafts running at right angles to the power-shaft.

Again, the speed is further reduced and safety insured by worm gearing between the three shafts above mentioned and the final shafts directly connected to the movements. In the figure the nest-gear on the left controls the hoist by the fork A and that in the center the traverse movement by the fork B, and that on the right the travel movement by the lever L. In the first two the friction-surfaces of the cones are of leather, while that of the cones for the travel-movement is of paper, this having been found to work better. In the plan the shafts for the two first movements are seen, being in the same plane, perpendicular to the plan, and therefore not seen. The latter delivers its power through worm gearing to a shaft fixed in bearings on the crane in a direction across the track, so that the propulsion movement of the crane is delivered through spur gearing to the wheels on each rail. The movement of traverse is effected by the two pitch chains passing around the shaft as shown. The upper turn of each chain passes to the carriage and is there fixed, while the under sides are continued across the crane, where they pass over pulleys and return to the other side of the carriage, where they are fixed.

The hoist movement is effected by a chain fixed at the further end of the crane,

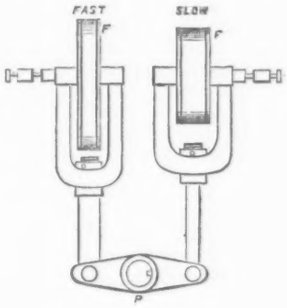


Fig. 4.

which passes over a pulley on the carriage, through the falling block, over a second pulley on the carriage, and then round the shaft supplying the power. The free end of the chain then passes up through an iron trough or casing, only sufficiently large to contain it, which is extended to a considerable distance horizontally, and contains the slack. A view of the interior of the working box below the crane on one side is given, Fig. 3, where the levers to control the movements are shown. These, together with the resistance commutator, which is also a switch for making and breaking circuit, are all within the reach of one man.

The mechanism is such as to permit of very gradual movements and the capability of working all three or any two of the movements together if required. While the erection of machinery in the hall was going on the crane was in continual use, and was found to be capable of very nice adjustment; for instance, the large Edison dynamo, weighing about 11 tons, was lifted and lowered accurately on to the toothed wheel-gear, mounted in three places on the bed-plate for the purpose of stretching its driving-belt in a vertical direction. Another piece of work was the fitting up of a fly-wheel to its shaft.

Next week we shall describe and illustrate the electric crane constructed by Mégy, Echeverria & Bazan, and which travels upon the other pair of girders.

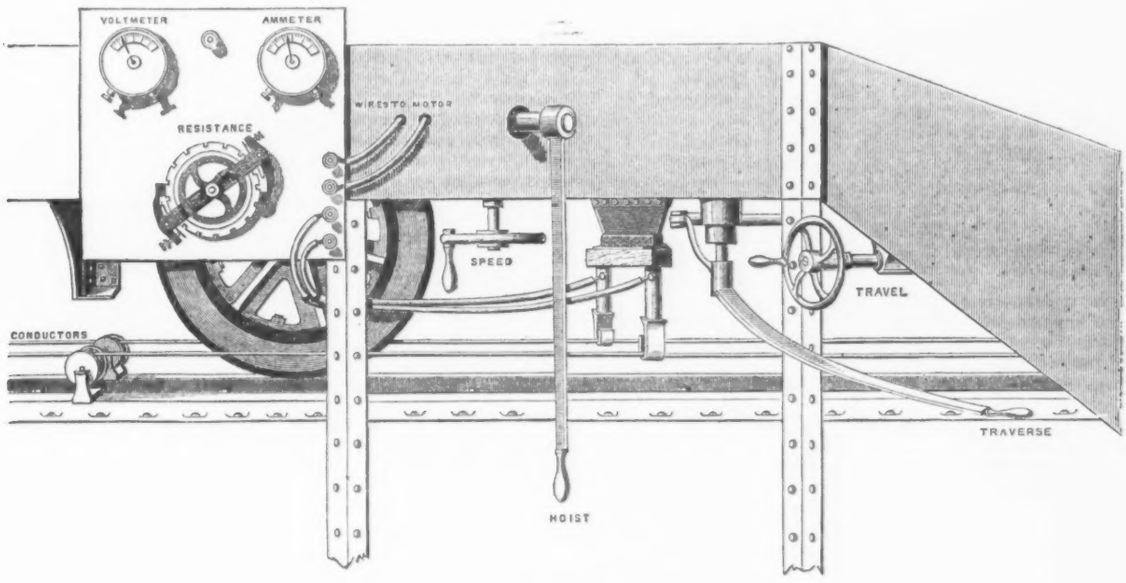


Fig. 3.—View from Working Platform.

THE BON & LUSTREMANT ELECTRIC CRANE.

The attendance at the Paris Exposition continues excellent. The following totals for the first four months of the years 1878 and 1889 show how much greater was the attendance this year:

	1878.	1889.
May	1,269,675	2,208,045
June	1,929,768	3,786,529
July	1,803,344	4,037,669
August	1,947,397	4,529,619
Totals	6,950,184	14,561,862

The numbers given represent the paying attendance. The number of tickets issued was, of course, considerably greater, because during the morning hours the entrance costs two tickets, and on special occasions three and even five.

Bids have been opened at the War Department for the supply of 100 7-inch and 50 11-inch steel cast shells to the Ordnance Bureau. The bids were as follows: Standard Steel Casting Company, Thurlow, Pa., 7-inch shells, $59.50 and $64.85 each; 11-inch, $127 and $137 each (each size of shell being divided into classes with octagonal and round cavities, respectively); Midvale Steel Company, Philadelphia, 7-inch shells, 40 cents and 33 cents per pound; 11-inch shells, 37 and 30 cents per pound; W. H. Long, Goodhue & Co., Burlington, Vt., 7-inch shells, $46.08 and $51.84 each; 11-inch, $132 and $145.20 each. The shells are to be delivered one-third in 60, one-third in 75 and one-third in 90 days after contract.

THE WEEK.

The will of the late Prof. Elias Loomis, the astronomer of Yale University, leaves $1000 to each of his sons, John C. Loomis, of Somerville, Ga.; E. V. Loomis, of Stillwater, Minn. The income of the residue of his estate, amounting to about $300,000, he leaves as follows: One-third to his son, Henry Bradford Loomis; one-third to his son, F. E. Loomis, and one-third to the Yale Observatory. Upon the death of his sons the entire income goes to Yale to assist in the payment of the salaries of observers and the publication of scientific works on astronomy. This, together with the moneys received from the Sheffield estate, make Yale richer by about $1,500,000 than during the first six months of this year.

There is such a pressure of work in the Hornellsville shops of the Erie Railway that the Saturday half-holiday has been abolished and the working hours increased from nine to ten

There are reports from Honduras of a new attempt to organize a confederation of the five Central American republics. It is believed that the three northern governments, Guatemala, Honduras and San Salvador, have already come to an agreement upon the subject, and that Nicaragua and Costa Rica can be induced to join them in forming the United States of Central America. The efforts made in other times to bring about this result were unsuccessful, but the separate republics have had several experiences within recent years that have given them a new disposition toward it. It is reported that our own Government is to be asked to aid in the promotion of the project, and it is likely to be taken up in Washington by the Central American delegates to the Congress of the Three Americas that will be held there next week.

Henry R. Van Keursen, superintendent of tolls of the Brooklyn Bridge, has testified that the heavy rush of foot passengers is between 6.30 and 7.30 a.m. and from 5.30 to 6.30 p.m. The record shows that there were 8,828,200 passengers in 1884 and 21,843,470 during the first eight months of 1889. The average number of passengers taken during the "rush" hours is 14,000 or 156 per minute.

There is some talk among the window-glass manufacturers of the Pittsburgh district over the project to build tank-furnaces.

Philadelphia has a story that the scheme of organizing an anthracite coal trust is not by any means dead. Mr. Corbin and his friends are given as the prime movers in the matter. Mr. Corbin's friends in New York and the representatives of the other anthracite mining companies say that nothing new is transpiring in regard to the scheme, nor has anything been done in connection with it since Mr. F. B. Gowen originally proposed it.

The sash, door and blind manufacturers of the Upper Mississippi, from Burlington, Iowa, to Minneapolis, have a pool. It is claimed that none of the St. Louis concerns are interested.

Considerable surprise is expressed in official circles at Ottawa at the manner in which the British Government are treating the Extradition bill passed by the Canadian Parliament last session, which cannot become a law until it has received imperial sanction. It was submitted for approval to the British Government, and now it is intimated that the British authorities wish to hold it in abeyance for some unexplained reason. From what can be gathered the imperial authorities take the same view Sir John Macdonald at first took, that it might stand in the way of securing a full extradition treaty with the United States, who by this bill will obtain all they want without reciprocating in the extension of the list of extraditable offenses.

The Omaha *Bee* reports that all the labor unions and brotherhoods of the employees on the Pacific system of railroads have formed an organization which is to be known as the Brotherhood of Railway Employees. The amalgamation includes the Brotherhoods of Locomotive Engineers, Firemen and Brakmen; Switchmen's Union and Knights of Labor. The action has not yet been indorsed by the Brotherhood of Locomotive Engineers, but the subject will be presented at the annual meeting of the order in Denver, on October 16. It is expected that this move will be followed by consolidation on all the roads in the United States.

St. Louis merchants claim that in spite of their efforts to overcome the tendency by bidding higher prices for corn, they are being excluded from the trade by discriminating on the part of railroads.

Powderley has at last been heard from. In an address before the National Convention of Miners and Laborers at Wilkesbarre he is reported to have said: "The great battle of the Knights of Labor in the future will be fought in the halls of legislation."

At a depth of 530 feet natural gas was struck in a well six and a half miles from San Antonio. It is claimed that the flow is 50,000 cubic feet in a day.

It is rumored that Coxe Bros. & Co. are making arrangements for the transfer of the transportataion of their output of nearly 2,000,000 tons per annum to the Reading Railroad as soon as their recently projected extension shall be finished.

The exposition at Detroit has been opened with a great flourish.

The Board of Trade and the Manufacturers' Club of Philadelphia are agitating the scheme to provide for that city a belt line railroad, under conditions which will insure access to the river fronts of Philadelphia by rail companies upon exactly equal terms.

The steamship England, of the National Line, has sailed with the largest single shipment of live cattle ever carried out of this or any other American port. She will carry across to Liverpool no less than 1022 live steers, averaging fully 1400 pounds each, shipped by "Nelse" Morris, of Chicago. In addition, Eastman & Co. ship by the same steamer 1700 quarters of beef, making the beef cargo carried, alive and dead, equal to 1425 cattle. The boom that has for a year back revived the export cattle trade in this country shows, it is seen, no sign of diminution. Something like 16,000 head of cattle are shipped from American ports every week to Europe, from the ports of New York, Philadelphia, Baltimore, Boston and Montreal.

Electric cars have given rise to a few accidents. There was a runaway in Pittsburgh lately, which, however, caused no serious injuries to anybody.

The Secretary of Public Works of Mexico has made a contract with José Maria Varlea and José Roman Seal, whereby the latter agree to set out 15,000,000 rubber trees on their estate in the State of Oaxaca, with 15 years' planting, 300,000 the first year and 1,000,000 in each of the remaining years. The Government agrees to pay, by way of subvention, 3 cents per tree planted, and allows the free importation of the necessary machinery and appliances. The concessionaries, or the company they may organize, are authorized to operate the plantation for 90 years, at the end of which time it may be acquired by the Government on equitable terms.

A little railroad war is progressing between the Schuylkill Valley and the Reading railroad companies over the occupancy of some land in the vicinity of the Pencoyd Iron Works.

A report is current that leading brick manufacturers had under consideration the formation of a combination for the purpose of controlling the output as well as the prices of brick. The promoters of the scheme were said to be the same as were concerned in the organization of the Cotton-seed-oil and the Lead trusts. The *Commercial Bulletin* concludes that it seems safe to assert, however, that something is working in the nature of a combination, and it is expected that it will take practical shape in the course of a week or so.

The Philadelphia *Record* complains that Philadelphia is losing ground in the iron-ore trade, the importations from foreign countries showing a tendency to go to Baltimore.

The opposition of the Southern cotton-growers in the Jute Combination is beginning to tell. The first ocean tramp steamer which cleared from Charleston, S. C., lately for Barcelona, had a cargo of about 3500 bales of new cotton on board, about one-fourth of which was covered with the new cotton-bagging adopted by the Farmers' Alliance. These bales were taken on board after going through the usual handling, without demur on the part of either the ship-owners or agents or the underwriters.

George Rice has become famous for his struggle against the policy of the railroads who encourage the Standard Old Company. The Interstate Commission has, however, recently decided that his petition for the production of books of oil carriers is not in proper form.

An entirely new departure in banking in Mexico is the permission accorded the newly-chartered Agricultural and Industrial Bank of Puebla to change its name to the Agricultural and Industrial Bank of Mexico, to establish its offices at the City of Mexico, and to issue mortgage bonds in foreign countries. These bonds will only be issued to the amount of 25-year mortgages actually held in the vaults of the bank here, and the scheme is very similar to the cedulas issued by hundreds of millions of dollars by the Argentine banks and held in Europe.

A dispatch from Monteville, a town near the scene of the recent race troubles in Bibb County, Ala., says the negroes have all resolved to do no more work for white people. The negro women are in the movement, and white families are unable to obtain cooks or women to do their laundry-work. The negroes refuse to work on the farms, and many farmers will be unable to gather their crops unless they can obtain white laborers. The only reason given by the negroes for their action is that they are tired of working for white people.

The operations of the Suez Canal in August and for eight months of the last three years have been, expressed in francs:

	1889.	1888.	1887.
August	5,050,000	4,965,039	4,432,728
Since January 1..	45,778,929	44,029,464	38,773,638

The merchant and cotton exchanges in Memphis, Tenn., are receiving daily protests against the adoption of the recommendation of the cotton convention recently held in New Orleans to tare cotton wrapped in jute 24 pounds and that in bagging 16 pounds. The indications are that the rule will not be adopted by the Memphis Exchange.

MANUFACTURING.

Iron and Steel.

Riter & Conley, of Pittsburgh, Pa., have just completed for the Philadelphia Gas Company a mile of 36-inch wrought pipe made of steel plate riveted, Under a pressure of 75 pounds there was no appreciable leak in it.

In our issue of August 15 we made mention of the fact that a steel plant would probably be erected in the near future at Ironton, Ohio. We are now advised that the parties who intend to build it are the Kelly Nail and Iron Company, Belfont Iron Works Company, both of Ironton, and the Norton Iron Works, of Ashland, Ky. These three concerns have decided to build the plant for the purpose of furnishing steel for their nail factories. It has not as yet been decided whether to locate the plant at Ironton or Ashland, but that question will probably be decided during the present week, and work commenced at as early a date as possible.

The Carbon Iron Company, of Pittsburgh, recently turned out in their works a steel plate 16 inches wide, 135 feet long and ⅞ inch thick.

On Thursday, the 19th inst., Geo. F. Baer, president of the Reading Iron Company, at Reading, Pa., purchased the two anthracite furnaces of the Keystone Furnace Company, located in that city, together with all the tools, cars and other equipments of the Reading Trust Company, the assignee, for $100 above the amount of the encumbrances. These consist of a mortgage given by the Keystone Furnace Company to the Reading Trust Company of $175,000, with interest at 5 per cent. per annum, dated August 1, 1887, and under the terms of the mortgage $17,500 interest was due on the 1st day of August, 1889, and $8750 due January 1, 1889, both of which sums still remain unpaid. The purchase was made by Mr. Baer for the Reading Iron Company, and as soon as the transfer of the property has been made some improvements will be made to the furnaces and equipments, and they will then be put in full operation.

Montgomery Furnace, of the Montgomery Iron Company, at Port Kennedy, Pa., was blown out on Wednesday, the 18th inst., for an indefinite period. A number of important improvements will be made to the furnace before it is again put in blast.

P H. Corr, of Boston, has bought the entire plant of the Old Colony Iron Works, at East Taunton, Mass. He is negotiating with out-of-town parties for the establishment of a special class of work in the rolling-mill.

The Allegheny Bessemer Steel Company, of Pittsburgh, are making a number of important improvements at their steel-rail mill at Duquesne, Pa. A contract has been let to the Swindell & Smythe Company, of Pittsburgh, for the immediate erection of soaking-pits. The cupolas, ladles and ingots are also being enlarged. When these improvements are completed they will add about one-third to the capacity of the plant.

The Lancaster Iron Company, of Pittsburgh, have been granted a charter, with a capital stock of $1000. The directors are Edwin H. Smith, Charles S. Crawford, Charles C. Morrow, W. A. Schmidt, William Beal, L. H. Matthews and Frank W. Smith.

Himrod Furnace, at Youngstown, Ohio, formerly operated by the Brier Hill Iron and Coal Company, but recently leased to J. Frank Eagle, was put in blast on the 19th inst. The furnace has been idle for some time, during which extensive improvements were made, which will add considerably to its capacity.

The old Irontown Furnace, situate at Irontown, Preston County, W. Va., has been sold at auction for $3000, and will be torn down and the material removed to Ohio. When this furnace was built 12 years ago it cost the owners $100,000.

The rolling-mill of the Catasauqua Mfg. Company, at Ferndale, Pa., is being rebuilt. A new roof is being put on and the entire mill thoroughly overhauled and enlarged.

The Straight Fiber Iron Company, of Chicago, have secured the services of M. C. Williams, of Burlington, Iowa, who will be on the ground about October 1 to organize a working force to run the rolling-mill of the company, which is being rebuilt on a larger scale and in a strictly fire-proof manner.

The flood of the Brandywine Creek led to injuries to the buildings of the Viaduct Iron Works, of Coatesville, flooding them, with the mills of Greenwood and Worth Bros.

No. 3 furnace of the Glendon Iron Company, at Easton, Pa., during the week ending September 14 made 808 tons of mill iron, mostly No. 2 and gray forge, on a fuel consumption of 1 09 tons per ton of iron. Before being remodeled by M. P Janney the best record of the furnace was 503 tons.

It is reported that Cooper, Hewitt & Co. contemplate the erection at Trenton, N. J., of three large open-hearth furnaces. They will use the basic process.

The New York Iron Company will start their furnace at Black River Falls, Wis.

It is reported that there is a movement on foot to form a stock company to build a new mill at Dunbar, on the Baltimore and Ohio road. It is proposed to erect 30 puddling-furnaces and manufacture skelp iron exclusively.

The long strike at the Columbia College Rolling Mills, Lancaster, Pa., has been formally declared off at a meeting of the Amalgamated Association. Most of the strikers' places have been filled with non-union men, and these will be retained. The strike lasted nearly seven months.

The Chouteau, Harrison & Valle Iron Company, St. Louis, held an annual meeting recently and elected three directors—namely, Charles P. Chouteau, Edwin Harrison and Charles C. Maffit. Their manufacturing plant, the Laclede Rolling Mills, is still idle, with no prospect of a resumption of work. They are operating their iron mines in Southwestern Missouri.

The report comes from Chicago that papers have been signed by which 111 acres of land at East Chicago were transferred to a Cleveland, Ohio, law firm on behalf of an iron company of that city, for a consideration of $400 per acre. The purchasers, it is given out, propose to at once begin the erection of an iron rolling-mill plant which is to be in working order by the opening of spring.

At a meeting of the directors of the Macungie Iron Company, at Allentown, Pa., it was decided to put their furnace in blast as soon as the necessary repairs can be made, which will require about three weeks.

The New York and New Orleans Coal and Iron Company have purchased 64,000 acres of coal and iron lands at Wallview, Marion County, Tenn., on the Tennessee River. Logan H. Roots, Little Rock, Ark., is president; Charles P. Richardson, Chattanooga, first vice-president; H. I. Kimball, Atlanta, second vice-president and general manager; Ed. E. Richardson, treasurer; J. W. Hudson, Wallview, Tenn., secretary.

The work of building the rolling-mill at Iron Gate, Va., is progressing favorably, a large part of the machinery being on the ground.

The Center Iron Company's Furnace, at Bellefonte, Pa., is being relined and remodeled in accordance with designs furnished by Frank C. Roberts, C.E., of Philadelphia.

Machinery.

W. B. Pollock & Co , proprietors of the Mahoning Boiler Works, at Youngstown, Ohio, are operating their works to their utmost capacity and have sufficient orders on hand to keep them busy for some time to come. They are making a specialty of the erection of oil tanks, and have orders on hand for 75 to go to various firms.

The Akron Tool Company, with a capital stock of $100,000, are being organized at Akron, Ohio.

The Walker Mfg. Company, of Cleveland, Ohio, have just received a contract for cable-winding machinery for a cable railway to be built in Seattle, Wash. Ter., by the Pacific Cable Construction Company, of San Francisco, Cal.

The Midgley Wire Belt Company, of Beaver Falls, Pa., have been granted a charter, with a capital stock of $350,000. The directors are: James E. Emerson, Thomas Midgley and E. L. Hutchinson, of Beaver Falls; James W. Rabe, of Philadelphia, and C. M. Russell, of Massillon, Ohio.

Under date of the 17th inst. Thos. E. Berry, secretary of the Ohio Thresher and Engine Company, of Upper Sandusky, Ohio, writes us as follows: "The Ohio Thresher and Engine Company were incorporated under the general laws of this State August 19, 1889, with a capital stock of $100,000. We are now building shops. Our location is on a tract of about six acres of land lying at the junction of the P., Ft. W. and C. Railroad on the C., H. V. and T. Railroad. Our main shop is 200 x 50 feet, two stories; another 120 x 50 feet, one story; in addition to these there is an engine and boiler room. We intend to equip the shops with all new first-class machinery, suitable for the building of the best threshing-machine and the best engines made in this country. At the head of each department will be interested men of long experience. Having an abundance of natural gas which assures us cheap fuel, and intelligent, skilled foremen, we can feel assured of success." The following are the officers and directors: J. J. Stoll, president; A. Burneson, vice-president; Wm. Ackerman, superintendent; T. E. Beery, secretary; J. A. Maxwell, treasurer. Directors: P. Cuneo, J. J. Stoll, Wm. Ackerman, Dr. R. N. McConnell, A. Kuneman, M. H. Brinkerhoff, David Cramer. A. Burneson, C. B. Hare.

The St. Louis branch of the Dean Pump Company has taken an order from the Argentine (Kan.) Water Works for two compound duplex pumping-engines of 1,250,000 gallons capacity daily each, and they are now in process of construction at the factory, Holyoke, Mass.

A new engine intended for both marine and stationary purposes has just been put on the market by the Ames Mfg. Company, of Chicopee, Mass. It is an upright duplex high speed engine, making anywhere from 1500 to 3000 revolutions per minute, and can be instantly reversed. The same company are also building an upright duplex steam-pump, which embraces the same principles as the engine. The Hussey

Re-Heater and Steam Plant Improvement Company, of 15 Cortlandt street, New York, have taken the general agency.

The Lodge & Davis Machine Tool Company, of Cincinnati, have increased their capital stock from $300,000 to $500,000.

A. B. Pitkin, Providence, R. I., has been appointed exclusive sales agent for Dexter Machine Company, Dexter, Maine, makers of screw-cutting lathes and upright drills. Mr. Pitkin will carry a stock of these machines at Providence.

The boilers of the Duluth Electric Light and Power Company, designed by E. D. Leavitt, are to be supplied with corrugated flues 40 inches in diameter and 18 feet long, manufactured by the Continental Iron Works, of Brooklyn, N. Y. The same firm are also supplying six corrugated flues 36 inches in diameter and 6 feet long for the new steamer Algonquin, whose engines are being put in by the Dry Dock Engine Works, of Detroit

The Niles Tool Works, of Hamilton, Ohio, have issued a pamphlet illustrating and describing their planers, which are made in all sizes from 26 inches to 10 feet square. The special claims for them are that "they are first-class, moderate in price, perfect in workmanship, positive feeds, with no friction to slip or stick, quick return, extra heavy, large bearings and the smoothest-running planers in the market." The planers are driven by worm gearing and the worm runs constantly in oil. Pitches are calculated for the least friction. More net power, it is claimed, is thus developed than in a train of spur gearing. The planers are provided with one or two heads on the cross-rails and side-heads on one or both housings. The side-heads have power feeds. Copies of the pamphlet can be had on application to the company.

The Hewes & Phillips Iron Works, of Newark, N. J., have just published a very handsome catalogue illustrating the principal features of their well-known Corliss engines and vertical and horizontal tubular boilers. The engines comprise non-condensing, condensing, compound, triple and quadruple expansive. An attractive feature of the catalogue is the cover, which is dark bronze in color and upon which a Corliss engine and vertical boiler and the name of the firm are embossed.

The Eureka Manganese Company, of Washington, D. C., would like the address of the manufacturers of the Keystone Drill, "a boring apparatus supposed to be light, convenient and portable, to be used in the same way as in prospecting for gas or oil."

We have received circulars which fully illustrate the well-drilling machinery manufactured by the Wells Machine Works, of Fostoria, Ohio. The circulars plainly show the construction of the drilling-machines and also the forms of the many tools used in well-drilling.

The Universal Radial Drill Company, of Cincinnati, are constructing a novel boring-mill for the Triumph Steam Engine Company, who are building compound engines having six cylinders, arranged in pairs, tandem, and the whole being cast in one piece. The mill will bore the three cylinders at one operation. It consists of a heavy bed-piece, at one end of which is fastened the large head-stock which contains the three boring-bars. The position of the middle bar is fixed and the bar on either side can be adjusted to suit the various distances between cylinder centers. The cylinders are clamped to a heavy table which rests upon flat-top ways on the bed, and a strong screw feeds the table either to or from the head-stock. The table, or carriage, also carries the tail-stock, which consists of a short standard fitted with bushings, in which the boring-bars rotate, these bushings sliding along the bars as the carriage is fed toward the head. It will thus be seen that the work is fed over the cutters instead of the bar being fed, as usual in most boring-mills. The machine has large bearings, is very substantial and weighs about 16 tons.

The Pratt & Whitney Company, Hartford, Conn., are manufacturing gun machinery for Belgium and Germany. The works will be run to the full capacity every hour in the day. The company are just finishing rifling machinery for the Lee gun, the arm adopted for the English army. The orders obtained there will reach about $600,000.

The Ball Engine Company, of Erie, Pa., have reopened their Chicago office (formerly with Kingsland Bros.) at Room 403 Home Insurance Building, 205 La Salle street. H. A. King, from the home office, will be in charge and will promptly reply to inquiries, furnish prices on engines, estimates on complete steam-plants, &c., and attend to all business exactly as if addressed to the home office. This step is made necessary by the large and increasing demand for the Ball engine for electric-lighting work.

From Albert B. Bowman, of St. Louis, Mo., dealer in iron, steel and brass working machinery, we have received circulars showing in part the various machines handled by him. Here are shown lathes, planers, pipe-machines, shapers, screw-machines, chucks, drills, &c., built by some of the best-known manufacturers in the country.

The Washington Navy Yard has just received and will put up within three or four weeks a band-saw for cutting sheet-steel 2 inches thick. The tool was made by Greenwood & Batley, of Leeds, England, and cost $16,600.

The monthly stock bulletin of the Westinghouse Machine Company, issued August 1, shows 232 completed engines in their warehouse and 218 engines in progress through the shops. This makes a total of 450 engines, aggregating 22,500 horse-power. Orders for the past six months have averaged nearly 1000 horse-power per month more than the output, hence the present stock of engines, large as it is, is much below the normal. The shops are now running on double turn and adding a line of heavy tools, and it is expected that their present capacity is fully 5000 horse-power per month. It is the practice of the company to keep in stock for immediate delivery a full line of engines of every style manufactured by them, from a 5 horse-power junior engine to a 300 horse-power compound engine. At present they are oversold in some sizes, particularly in the compound engines, for which there is an extraordinary demand.

Hardware.

The Empire Plow Company, of Allegheny City, Pa., have decided to remove their plant to Cleveland, Ohio, at as early a date as possible. The firm have recently bought the property of the Malleable Iron Company, containing about 4½ acres of ground, with buildings, to which some additions will be made. In their present location the company are turning out 300 steel plows and 8 tons of steel shapes per day. This output will be doubled when the removal is accomplished.

The incorporation of the Toledo Wire Nail Company, Toledo, Ohio, with a capital stock of $60,000, is announced.

The Lunkenheimer Brass Mfg. Company, Cincinnati, Ohio, issue a circular calling attention to their recent extensive improvements for the manufacture of their goods. In addition to the construction of a new four-story brick building, they have added many new lathes, numerous other tools and special machinery, thus increasing their capacity about 25 per cent.

Miscellaneous.

The National Pulley Covering Company, of Baltimore, announce their removal to more commodious quarters at 23 South Charles street. This change has been made necessary by the steady growth of their business, their present quarters being too small to accommodate them.

The employees of the Philadelphia Smelter, Pueblo, numbering over 200, have struck. Last June the furnace men made application for eight-hour shifts during the summer, and their request was granted with the understanding that the 12-hour shifts be renewed on September 15 under the 12-hour plan. Those men who had been getting $3 for 12 hours' work were to be paid $2.50, and those who had been getting $2.75 paid $2.25. On the 10th of this month a delegation of employees waited upon the manager and requested that the eight-hour system be continued.

The *Iron Trade Journal* states that a contract for 100,000 steel ties has been placed by a Mexican railway company in the Cleveland district, England, at £5 per ton, and that locomotives and tenders valued at £14,000 were shipped from the Clyde for Vera Cruz a few days since.

From the Jos. Dixon Crucible Company, of Jersey City, N. J., we have received a pamphlet in which letters are printed from some of the best-known firms in the country indorsing Dixon's silica-graphite smoke-stack and boiler-front paint for locomotive and steam-boat stacks, smoke-arches, ash-pans, boiler-fronts and other iron-work.

The *Bulletin* of the American Iron and Steel Association states that Mr. Carnegie is letting his wage-book speak for him. The scale of pay for labor in the Homestead Works for May, 1889, was as follows:

	No. of men.	Total wages.	Monthly wages.
Converting-mill	57	$4,642.90	$81.45
28-inch blooming-mill	26	1,728.30	66.47
28-inch mill	32	1,909.73	59.68
33-inch beam mill	49	4,491.25	91.65
119-inch plate mill	27	2,312.80	85.66
Totals	191	$15,084.98	$78.98

Making nearly an average of $1000 per year. The wages are not quite double the English scale.

Rumors which come from Paris indicate that American manufacturers of machinery have carried off the lion's share of the grand gold medals to be awarded. It is stated that four out of a total of twelve to exhibitors in the machinery hall go to this country. Three names are given, although it is, of course, impossible to vouch for the accuracy of the reports. We hear that the successful exhibits alluded to are the Babcock & Wilcox boiler, the Sweet engine and the Worthington pump.

The Treasury Department has furnished a statement to the press to the effect that since the enforcement of Secretary Windom's regulations of July 17, 1889, governing the importation of Mexican ores, up to date the quantity of silver-lead ores imported into the United States from Mexico was only one-half of the quantity of such ore imported during a like period immediately before the new regulations were issued, while the value of the ores was much greater, indicating that a large quantity of low-grade ores formerly admitted free of duty was now excluded.

Work is to be begun in the development of the water-power of the famous Dalles of the St. Louis River, near Duluth.

The Iron Age

New York, Thursday, September 26, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

Originality in the World's Fair.

Whatever decision may ultimately be reached on the question in which of our greatest cities the World's Fair of 1892 is to be located, some considerations deserve attention during the early stages of the work to be done. We observe an unfortunate tendency, against which a vigorous protest should be entered. The ideal which seems to be before the majority of our people is that whatever we do we must eclipse everything in size. The plan seems to be to cover more acres of ground with larger buildings, and above all, to build a tower anywhere from 300 to 1000 feet higher than that of Eiffel. This latter ambition appears to us to border on childishness, and its only possible justification can be that in Europe everybody expects us to do that very thing. What made the Eiffel Tower famous was the originality of the conception and the boldness of the execution. To clap on a few hundred feet is certainly not original and cannot be considered daring. A 1500-foot tower in New York or Chicago or Washington would be a lasting monument of our powers of imitation and our love of boasting. Its novelty is the chief claim of the Eiffel Tower to admiration and attention. American genius, skill and daring ought to be able to discover some worthier object. If we want to outdo the Parisians let us undertake something original, grand and above all useful. It is well to humor Mr. Eiffel's friends and accept without discussion their laborious explanations of the utility of his great monument to science, military art, &c., but those who are frank about it will acknowledge that the Eiffel Tower is a splendidly-successful advertisement of the Paris Exposition—nothing more. Its efficacy in that capacity has been exhausted, especially when what we want is something to attract Europeans, to whom it has lost the charm of novelty. Our own people can be expected to come to the World's Fair in great numbers, even without a 1500-foot monument.

Another widespread idea is that a "big" acreage is a first consideration. Any one who has wandered about in the wilderness of second and third rate exhibits of any of the great world's fairs must have been convinced of the necessity of contracting rather than expanding these shows. There is no good reason why a dozen concerns who are rivals in making ugly and poor hats should be given the privilege to inflict hundreds of square feet of them upon an indifferent and tired public. In a good many industries collective exhibits carefully chosen should be insisted upon. Every legitimate effort should be made to keep the size of such a show within reasonable bounds. The simple fact that some person is willing to spend a good deal of money to show what nobody cares to see ought not to be a sufficient justification to swell an unwieldy mass of articles. Until now a few thousand exhibitors have been allowed to largely defeat the objects of millions of visitors. It is to be hoped that, so far at least as the American section is concerned, a reform will be made in this direction in 1892.

The Foreign Iron and Steel Trades.

Leaving out of consideration the rise in certain kinds of raw material, like ferromanganese and spiegeleisen, the movements in the foreign iron markets have had only an indirect interest for American iron and steel masters. Prices abroad have had little significance except that they have marked the limit to which an advance here could go without bringing European makers into the field as active competitors. As the basis for business to importers they have become more and more discouraging, since the advance in Europe has been greater than the later rise on this side. The two markets have gone apart steadily. Statistics fail to reflect this; in fact, they have thus far shown very little of a heavier movement in England or a notable decline of imports here. In reality they are practically a record of business done, often a long time ago. If we had figures showing the aggregate on the order-books abroad the story would be quickly told. As it is, prices alone reflect the altered condition of affairs. An examination of the last data to hand will illustrate this well. The official export statistics of Great Britain for the first eight months of the year show the following:

English Exports of Iron and Steel, Eight Months. Gross Tons.

	All countries.		United States.	
	1888.	1889.	1888.	1889.
Pig-iron	711,353	748,419	100,235	77,096
Bar, angle, bolts and rods	195,562	174,274	3,274	3,574
Railroad, all sorts	703,978	708,902	339,882	12,496
Iron and steel wire	42,961	36,688	n. spec.	n. spec.
Hoops, sheets, plates	270,447	259,615	28,092	23,260
Tin-plates	263,562	290,832	196,388	229,975
Cast and wrought, not enumerated	281,672	309,863	3,243	2,049
Old material	100,491	89,623	16,190	16,449
Steel, wrought	100,372	94,776	45,803	26,156
Manufactured steel or steel and iron combined	10,898	13,941	n. spec.	n. spec.

No startling increase will be observed by glancing over the figures for the exports of Great Britain to all countries, and the price in England would be puzzling were it not known that ship-building has been exceedingly active and has called for very large quantities of material. Their business with us has fallen off, but has been more than compensated for by greater activity in other quarters.

Our own import statistics, covering as they do our purchases from all parts of the world, fail to show a very heavy falling off. The figures below cover the seven months of the fiscal years 1888 and 1889 till August 1:

Imports Seven Months.

	1888.	1889.
Iron ore, gross tons	382,490	466,721
Pig-iron, gross tons	113,059	93,518
Scrap-iron, gross tons	31,267	19,245
Scrap-steel, gross tons	6,372	1,295
Bar-iron, net tons	16,316	17,285
Steel rails, gross tons	6,163	4,553
Cotton ties, net tons	8,748	10,236
Steel hoops, sheets and plates, net tons	14,833	10,696
Ingots, blooms and billets, gross tons	74,036	63,011
Sheet, plate and taggers iron, net tons	3,627	4,605
Tin-plates, net tons	194,476	230,787
Wire-rods, net tons	75,959	50,993
Wire and wire-rope, net tons	2,184	2,602
Anvils, axles and forgings, net tons	951	1,089
Chains, net tons	550	395

The falling off, so far as the tardy records go, is not, therefore, very great, but, as we have said, the statistics merely show what was done long ago. For the past few months very little business has been done except in tin-plates and spiegel, but these facts will only begin to tell in the import figures months from now.

What tells is the advance in prices. On the first of this year No. 1 Summerlee was selling at 50/6. Our cable last week made it 64/, an advance of $3.25. Middlesborough No. 3 was 33/9; now it is 44/, equal to a rise of nearly $2.50. Mixed numbers of West Coast hematite were quoted 45/. They have advanced to 65/, a gain of nearly $5. On manufactured iron and steel, taking the lowest price in August, 1888, as the basis, we may mention that bar-iron has risen from £5. 12/6 to £6. 5/, or $3.25; nail rods from £5. 17/6 to £6. 10/, or $3 a ton; hoops from £6. 2/6 to £6. 15/, or $3; sheets from £7. 10/ to £7. 12/6, or 60 cents; and steel rails have jumped from £3. 17/6 to £5. 2/6, or $6.10. It should be noted, besides, in considering the effect of advances in Europe upon our markets, that they tell very much more heavily, so far as this market is concerned, on those articles on which there is an ad valorem duty. Take, for instance, billets early in the year at 82/5 against 90/ now. This would seem only 8/ rise, or a little less than $2. But adding 45 per cent. ad valorem in each case we have 118.9/, against 132.5/, an advance of 13.6/, or $3.26. That, of course, holds good in the case of wire rods, sheet-steels, blooms and all the articles in the steel schedule on which the ad valorem rate is levied.

As for the future, we can only quote a recent article in that conservative journal, the London *Economist:* "From every point of view, therefore, the condition of the iron and steel trades must be regarded as satisfactory. The accumulation of stocks, which became so large before the revival set in, has gradually been much reduced, and seems likely to be still further diminished. The demand for manufactured commodities is at the same time continuing to expand, and as the general advance in prices has only been moderate, the prospect is that the improvement to which we have been referring will make further headway before the current year comes to an end."

It is clear that we can advance prices in this country considerably before we are interfered with by European competitors. It is simply a question whether or not a further rise will curtail consumption. We do not think that it will, because prices now are moderate and are not likely to bring in any old-fashioned concerns which have been idle for a long time because they were out of the race.

During the long depression, now happily a thing of the past, a few branches of the iron trade reached the deplorable distinction of being particularly demoralized. Prominent among them was the wire trade, salesmen glorying in discounts of 75 and 10 and 2½ and 2. The buyer de-

manded and secured special privileges. He found little trouble in getting No. 11 and having it billed as No. 10, and was promptly supplied without extra charge when he called for No. 10¾. With the rise in steel conditions began to change, so that now, for the first time in a long while, wire manufacturers have assembled to discuss the situation and ta'k of reform. A meeting was held in this city early in the week, at which such concerns as Washburn & Moen, Oliver & Roberts, Cleveland Rolling Mill Company, Trenton Iron Company, Roebling and others were represented. The question of advancing prices was talked over and both 75 per cent. and 75 and 2½ per cent. found earnest advocates. A few figures will quickly prove how healthy a moderate advance would be. During 1888 wire rods, the raw material of the wire manufacturer, sold, delivered at Eastern mill, at $37. To-day the same stock cannot be purchased for less than $47. Making allowance for waste in heating and scrap, the advance represents nearly ½ cent a pound. Taking 2.15 cents as the lowest done, the rise in rods would warrant an advance to 2.65 cents, or, say, 72½ and 5 per cent. There are some considerations, however, which would prevent an improvement approaching that figure. Those mills which roll their own rods naturally figure on the basis of the billet, and there the appreciation has not been nearly so great. Even if they do not cover cost of wire-drawing, putting in the rods at the market price, the wire manufacturers who have modern rod-mill plants can make a very handsome profit. In other words, the wire manufacturers who must buy rods in the open market are hopelessly out of the race at the present time, so long as those who own their own rod mills are content with prices which give them the greater part of the profit which there is in rolling rods.

Trust stocks have acted in a manner lately which will make some of those pause who have been looking longingly at that method of pooling their properties. Dealing in mystery, and consequently particularly open to attack by rumor-mongers, those who are engineering trust stocks are finding their "securities" shrink in value. The speculative public is becoming shy of playing with loaded dice, and bankers do not view this class of collateral with much confidence. A goodly number of those who have entered into trusts and many who would like to have taken kindly to the plan because they regard it as the best means of selling out their property. Anything that narrows the market by discrediting this class of stocks directly affects adversely the possibilities of a profitable turn. There is, of course, a second class of manufacturers who enter a trust on its merits from another point of view. They see opportunities for increasing returns by cheapened distribution, lessened cost of manufacturing and greater control of the markets for raw materials. It is hardly necessary to choose any branch of the iron and steel trades as an example for illustration. It will be readily understood how the cost of delivery to the consumer can be lowered by diverting orders to the works most favorably located. Improvements in manufacturing methods and in machinery made at one establishment are promptly and fully reported to those in charge of the others. The power arising from unity of action in the purchase of raw materials is enormous and the advantages of dealing with transportation companies are hardly to be calculated. When once the difficulties incident to the valuation of plants and properties are overcome, the economies which can be realized are in themselves equivalent to very handsome profits, even on profusely-watered stock. The temptation to manufacturers to enter into trusts is undoubtedly great in spite of serious drawbacks, the principal one of which, of course, is the attitude of the community against such organizations—an attitude which has already led to adverse legislation and which might cause very serious changes in our tariff laws.

Electrolytic Copper.

For some time past rumors have been afloat that J. B. Haggin, who controls the Anaconda Copper Mine, of Montana, was contemplating the building of a plant to refine his own product electrolytically. It is now reported that the location for such a plant has been chosen and that the project is to be carried out. If it is the American copper market will be considerably affected by it. The Anaconda is the largest producer in the world, having in one year turned out over 60,000,000 pounds fine. From the smelting-works of the company the metal is shipped in the form of a matte, which must be refined. Now, the American refineries were unable thus far to handle so large a quantity, so that the greater part of the matte had to be and is still shipped abroad. If it is to be treated at home a larger proportion will seek the home market. The electrolytic process of refining copper has two very important advantages. First, it makes it possible to extract cheaply any silver which may be in the raw material, while the ordinary methods could pay only for anything above, say, $30 a ton. Butte City is also a great silver-mining camp, and the ores being refractory, it pays to smelt them together with copper ores low in silver, making a rich product. That business has been done to a considerable extent at Butte, and has been growing, the Haggin interest itself having acquired considerable mining property, with the object of developing this line of business. It will be seen, therefore, that a growing quantity of copper is becoming merely a carrier for the precious metals, and that this fact is tending to counterbalance to some extent the drawbacks to the Montana producers which grow out of a considerably lessened yield of their copper ore as greater depth is attained.

The second and to consumers a very important consideration in connection with the prospect of a large supply of electrolytic copper is the quality of that grade of metal. During the past few years considerable quantities of it have been on the market, and it has been pretty thoroughly tested by consumers. It has gone into mills where lake and special Arizona brands only had access previously. It has stayed there. So far as we can learn it does not quite equal lake for certain kinds of work, but it can be and is freely employed in its stead for other articles. That means that the great hold of the lake companies has lost much of its strength. It means that at no distant day the production of the best grades of copper is likely to be in excess of the demand, relatively; that therefore the differences in the price between the different grades must tend to lessen, and that consumers of the metal will have a better class of raw material to work with.

OBITUARY.

DR. GEORGE H. COOK.

George H. Cook, LL.D., Ph.D., State Geologist, vice-president of Rutgers College, died suddenly at New Brunswick, N. J., of heart failure. Dr. Cook was taken ill the day before in the college laboratory, but his illness was not considered at all serious, and his death was totally unexpected. He was born at Hanover, N. J., in 1817. In 1836 he became a civil engineer, and his first work was in laying out the line for the Morris and Essex Railroad. He also surveyed the line for the Catskill and Canajoharie Railroad. He was not, however, satisfied with his attainments, and entered the Troy Polytechnic Institute, graduating in 1839. He afterward became a teacher in the institute, and in 1842 he was made "senior professor," equivalent in office to that of president elsewhere. He afterward became professor of mathematics and natural physiology in the Albany Academy. In 1851 he became principal of the academy and held the office two years, leaving on his election to the chair of chemistry and natural philosophy in Rutgers College. The next year he was made Assistant Geologist of New Jersey, which position he held for three years. The office of State Geologist had been allowed to lapse for several years, but a paper read by Dr. Cook before the Legislature in 1864 led to its reorganization and his appointment as its head. His work as State Geologist has been varied and of great importance. The topographical maps of the State which have been published under his supervision have been adjudged to be among the best of any published by the different States. The last of the series was recently issued, and Dr. Cook was at the time of his death engaged on his final report. Two volumes had been prepared and are now in print. In 1864 the State Scientific College was attached to Rutgers, and Dr. Cook, while retaining his professorship, became vice-president of the college.

He was the organizer of the State Board of Agriculture, and for a long time he was its secretary He became in 1886 Chief Director of the New Jersey State Weather Service. He was long president of the New Brunswick Board of Water Commissioners. He was also a member of the State Board of Health, and held many minor offices in the State. He was active also in work elsewhere. In 1852 he was sent to Europe by the State of New York to make investigations that might aid in developing the Onondaga salt springs. He went again to Europe in 1870, and in 1878 he was a delegate to the International Geological Congress held at Paris in connection with the French Exposition. He was a member of the American Association for the Advancement of Science, and the author of many papers and addresses. He received the degree of Doctor of Philosophy from the University of New York, and the degree of Doctor of Laws from Union College.

The H. C. Frick Coke Company are negotiating for the purchase of all the coke plants of the Cambria Iron Company in the Scottdale region, consisting of 680 ovens.

The Charcoal Iron-Workers.

Tenth Annual Meeting.

The tenth annual meeting of the United States Association of Charcoal Iron-Workers began its sessions at Milwaukee, Wis., on the 17th inst. The officers of the association who were elected at the previous meeting are as follows: President, Irving M. Bean, of Milwaukee; vice-presidents, H. R. Stoughton, of Shelby Iron Works, Ala., Geo. B. Wiestling, of Mont Alto, Pa,, and J. A. Van Alstyne, of Wyandotte, Mich.; Executive Committee, Joseph D. Potts, of Philadelphia, Geo G. Lobdell, of Wilmington, Del., and J. C. Fuller, of Philadelphia; secretary and treasurer, John Birkinbine, of Philadelphia. The following persons were present at the Milwaukee meeting, at either the first or subsequent sessions:

Irving M. Bean, of Spring Lake Iron Company and Northwestern Iron Company, Milwaukee.
John Birkinbine, Philadelphia.
Victor O. Strobel, of Gordon, Strobel & Laureau, Philadelphia.
Edgar S. Cook, of Warwick Iron Company, Pottstown, Pa.
W. S. Mallory, of W. S. Mallory & Co., Chicago.
John G. Peebles, of Belfont Iron Works Company, Ironton, Ohio, and Ashland Coal and Iron Company, Ashland, Ky.
J. W. McGenniss, of W. H. Walbaum & Co., Philadelphia.
John W. Nesmith, Denver, Col.
A. R. Mackintosh, of Pine Grove Furnace, Hanging Rock, Ohio.
Justice Cox, Jr., of Catasauqua Mfg. Company, Philadelphia.
T. L. Bitler, Philadelphia.
Wm. D. Smith, of Temple Iron Company, Reading, Pa.
W. N. McGugin, of Olive Furnace, Ohio.
A. E. Noble, of Jenifer Iron Company, Jenifer, Ala.
Samuel D. Mills, of Martel Furnace, St. Ignace, Mich.
J. A. Mathieu, Detroit, Mich.
George Brooke, of E. & G. Brooke Iron Company, Birdsboro, Pa.
George Brooke, Jr., Birdsboro, Pa.
L. Heber Smith, of Joanna Furnace, Joanna, Pa.
J. J. Travers, of Knoxville Car-Wheel Company, Stony Creek, Tenn.
J. M. Ashlock, of Sligo Furnace, Mo.
H. A. Burt, of Carp River Furnace Company, Marquette, Mich.
V. K. Moore, of Leland Iron Company, Detroit, Mich.
W. B. Vance, of Martel Furnace, St. Ignace, Mich.
M. R. Hunt, of Ashland Iron and Steel Company, Ashland, Wis.
T. W. Robinson, of Mayville Furnace, Mayville, Wis.
F. W. Sivyer, of Northwestern Malleable Iron Company, Milwaukee.
Daniel Wells, of Northwestern Iron Company, Milwaukee.
M. L. Johnson, Milwaukee.
T. H. Rumsey, Milwaukee.
Geo. W. Cope, Chicago, Ill., representing *The Iron Age*.

A considerable number of those in attendance were accompanied by their wives, and the presence of the ladies formed a very pleasant feature of the sessions and excursions.

First Session.

On the evening of the 17th inst. President Bean called the first session to order in the hall of the Athenæum, a beautiful building in which the citizens of Milwaukee take much pride, as it was erected by an association of ladies and is exclusively managed by them for social purposes. But a small number of the members of the association being present at this session, President Bean remarked, by way of introduction to his address, that it had been said that the smaller the number the greater the blessing. If this is true there was undoubted reason for expecting results of unusual benefit upon this particular occasion. He then proceeded to congratulate the association upon the great advance which had been made in recent years in the manufacture of charcoal pig-iron, stating that now 60 tons a day was an average yield for Western charcoal furnaces, while one furnace, which would be visited in the course of a few days, was making the phenomenal product for a charcoal furnace of 100 tons per day. He then outlined the programme which had been prepared for the entertainment of the visiting members, promising them a week of rich opportunities for the acquisition of knowledge relative to the resources of the Northwest and the progress which had been made in developing them. Secretary Birkinbine then read his report on the membership and financial condition of the association, showing that it continued strong numerically, and that while not blessed with an overflowing treasury, neither is it suffering from impecuniosity. The present membership comprises 257 names, distributed over 25 States. Eleven members are residents of foreign countries. Four deaths occurred during the past year—viz., Wm. H. Barnum, S. H. Witherbee, W. R. Davenport and C. Sproug. A Committee on Nominations for Officers was then named as follows: L. Heber Smith, S. D. Mills, E. S. Cook and A. R. Mackintosh.

A Committee on Courtesies was also appointed by the president, consisting of the following gentlemen: W. N. McGugin, J. J. Travers and W. B. Vance.

Secretary Birkinbine then exhibited for the inspection of the members a number of samples of the very rich crystalline ore recently discovered in one of the mines at Port Henry, N. Y. The specimens were almost chemically pure magnetite, containing from 69.2 to 72.04 per cent. of metallic iron, and are therefore exceedingly rare. The pieces shown were perfect crystals of varying size and as brittle as glass, requiring careful handling to keep them in their natural condition. They excited much interest among the members of the association.

UNREDUCED ORE PASSING THROUGH A FURNACE.

Edgar S. Cook, of the Warwick Iron Company, Pottstown, Pa., at the request of the secretary then exhibited some curious specimens of partly-reduced iron ore which had been taken from the tuyeres of the Warwick Furnace, and proceeded to give an interesting description of the conditions under which they had been produced. Some of the pieces of ore were only partially deoxidized on the surface and some were incased in a covering of what appeared to be wrought-iron. The ore was from the Republic Mine, in the Lake Superior district, and when the pieces were broken they showed the distinct characteristics of this ore, although they had passed through the furnace. Mr. Cook stated that the furnace had been running on one lining for about three and a half years, making 108,000 tons of iron in that time. For the year ending on February 1 last the furnace had been running very well, making from 650 to 710 tons of iron per week, although it is but a small furnace, 15½ x 55½ feet. During February the furnace began to work irregularly, and the yield fell off to 550 and 600 tons per week. "About March 1," in Mr. Cook's words, "there was a regular circus. During the progress of the blast the brick-work of the bosh had melted away. This had been replaced in part by carbonaceous or graphitic material, together with some lime and finely divided ore. Owing to the large product of the furnace for the preceding months, at the time just referred to this filling loosened and slipped down *en masse* into the crucible. The temperature of the crucible was so reduced by this fall that it was with difficulty that the tuyeres were kept open. The iron-notch and cinder-notch became closed. Several tuyeres were closed at the nose by plugs of the spongy iron, followed by the partial fusion of unreduced ore, or, as we term it, fine ore dirt. The other tuyeres were kept open and the slag made was discharged from the furnace through the tuyere slagging-valves attached to the belly-pipes. These valves are operated by air-cylinders and are opened and closed with the engine running and the slag can be discharged without any risk or loss of time. After about 24 hours of close attention and hard work the furnace was again in fair working order. An examination showed that the brick-work on the west side of the furnace about the top of the bosh was only 2 to 3 inches thick, while on the east side it was 9 to 10 inches. This was determined by drilling holes at intervals through the furnace walls. In order to fill up and restore the bosh to something approximating suitable proportions it was decided to run the furnace on silver-gray iron in hopes that a graphitic bosh could be formed. It was while this effort was being made that the samples of unreduced ore were obtained from the tuyeres on the east side. We noticed that the tuyeres on the west side worked much better and brighter than those on the east side. The temperature was experimentally determined by driving bars of wrought-iron into the center of the furnace through the plug-holes of the several tuyeres. On the west side the bars became white-hot and melted off before they could be drawn out, while on the east side similar bars were bright red at the points and only dull red for the greater part of their length. About the same time the tuyeres on the east side were rapidly cut, exploding with reports similar to pistol-shots. As these tuyeres were removed the stock in front of them was shoveled out and preserved. It was from this stock that the specimens of unreduced ore were selected. At this time the stock was passing through the furnace in about 16 to 18 hours, and the iron made was chiefly No. 1. The slag was uniform and hot and the furnace was working fairly regular, but not with the usual fuel economy or average yield of iron. Owing to the shape of the furnace being oblong, instead of circular, it was supposed that a much larger volume of gas ascended on the west side than on the east. The gas currents thus established thoroughly reduced the ore on that side, but were deficient in quantity on the east side, and thus the ore on this side descended without being properly acted upon and reached the tuyeres and crucible unreduced. The presence of unreduced ore naturally made that side of the furnace work cold, and this again facilitated still further arrivals of unreduced ore in the crucible. The frequent loss of tuyeres was due to the formation of pockets under the tuyeres which filled with iron as it was melted, and this iron coming into contact with the bronze of the tuyeres produced the explosions. In order to correct this condition of affairs a long tuyere was placed on the west side, projecting 20 inches or more beyond the tuyere breast, and small nozzles of 3 inches in diameter instead of 5 inches were placed on the east-side tuyeres. This seemed to answer a good purpose, and it was not very long before the east side was heated up, ceased losing tuyeres and the temperature of the crucible seemed to be uniform on all sides. At all events, no more unreduced ore was discovered at any of the tuyeres. The effort to restore the bosh was found to be costly, calling for a largely increased consumption of fuel, which the condition of the iron market would not warrant, so we decided to work up our ore stocks and blow out for repairs. During the last six or eight weeks of the blast an increased

volume of air was blown in order to keep the furnace working regularly with its enlarged bosh area, so that the furnace was emptied in from 12 to 14 hours. Even when the stock was exposed only 12 hours I was not able to discover any unreduced ore at the tuyeres, so I am satisfied that the finding of ore only partially reduced some weeks previous was not due to rapid driving, but solely to the imperfect distribution of the reducing gases, and that these currents were influenced in a measure by the shape of the furnace."

A discussion followed in which a number of the members participated and in which the details of the occurrence were considered with reference to air-pressure, method of charging, nature of stoves used, &c. Mr. Cook then stated that this phenomenon is not likely to occur when coke alone is used for fuel. He used one-fourth coke and three-fourths anthracite, and anthracite-furnace practice was much more difficult than coke.

FIRE-BRICK STOVE CONSTRUCTION.

Victor O. Strobel, of Gordon, Strobel & Laureau, Philadelphia, then read a paper on "Fire-brick Hot-blast Stoves," in which were considered the several kinds of fire-brick stoves in use, and the advantages presented by some constructions over others. Large diagrams were used for illustration. Attention was particularly called to the question of the thickness of the fire-brick used in constructing the flues. In his opinion 4½ inches is thick enough, and will prove as effective in practice as a 9-inch brick. In reply to questions propounded by the members, Mr. Strobel added a number of general observations. A set of three 18 x 65 foot fire-brick stoves of the type preferred by his firm would cost about $30,000 in, say, the Hanging Rock region. For casing, $\frac{3}{16}$-inch plates are used for 16 x 18 foot stoves and $\frac{5}{16}$ for 20-foot stoves. Anthracite furnaces, in which very high pressures are blown, require casings of special strength, and steel plates are now used for such stoves. Between the casing and the outer wall of fire-brick 1 inch of space is left for the expansion of the brick. Although the glazing of bricks in the combustion-chamber interferes with their absorption of heat, it cannot be avoided. He would not admit that all fire-brick stoves were equally efficient and gave cogent reasons for his position.

After the discussion of Mr. Strobel's paper was concluded, the hour being late, the meeting adjourned.

Wednesday's Proceedings.

The whole of Wednesday was devoted to excursions, visits to local iron-works, &c. At 8.30 in the morning the members of the association and a number of interested citizens of Milwaukee took a special train, which had been tendered by the Chicago, Milwaukee and St. Paul Railroad Company, and proceeded to Mayville, 50 miles north of Milwaukee and 30 miles inland from Lake Michigan. Here they first inspected the Mayville Furnace and afterward examined the remarkable deposit of iron ore near by, which is known as the "flaxseed ore" of Wisconsin. The furnace was found in blast making coke foundry pig-iron, having been blown in on the 9th inst. by the Illinois Steel Company, who have leased it from its owners, the Northwestern Iron Company. This furnace possesses an interesting history, occupying the site of the oldest furnace in this section of the country. The original furnace was built in 1848 to smelt the local ore with charcoal. For many years the pig-iron made here, being high in phosphorous, was in great demand for the manufacture of iron rails, making the best material to be had for heads. The substitution of steel for iron in the manufacture of rails cut off a lucrative outlet. The present furnace, which was remodeled by John Birkinbine in 1887–88, is now 13 feet 9 inches by 67 feet, being much larger than its charcoal predecessor. The lines of the furnace are according to the usual practice, but the device used for cooling the walls is peculiar; water is conveyed by a series of coils and water-boxes high up the stack, far above the boshes. The lowest tier of coils consists of pipes arranged vertically and placed very close together. The water-boxes, further up, consist of iron boxes set deep in the stack, each containing a coil of pipe through which the cold water passes. The highest pipes are arranged horizontally. This arrangement has been found to work well in preserving the lining. A Weimer vertical blowing-engine is used, having an air cylinder with 72-inch stroke and 6 feet in diameter and a steam cylinder with 48-inch stroke and 32 inches in diameter. The Weimer charger is also employed. A mixture of Lake Superior and local ore is used. At present the percentage of local ore is from 30 to 40, but the furnace will be worked up to 50 or more very shortly, as it gets into proper shape. About 50 tons of pig-iron are now made daily, but the output will be considerably in excess of that when the furnace gets to working up to its full capacity. An inclined-plane double-track hoist is used. The iron ore mines in the immediate vicinity were next visited. This remarkable deposit of ore has been well described by John Birkinbine in a recent issue of the *Journal* of the Charcoal Iron Workers' Association, and from it we take the following particulars:

THE FLAXSEED ORE OF WISCONSIN.

There is probably no place in the United States where a large quantity of iron ore can be more cheaply mined than from the Iron Ridge deposit of Wisconsin, particularly that portion of it which is controlled by the Northwestern Iron Company, of Milwaukee. A ledge of Trenton limestone extends for a considerable distance through Eastern Wisconsin, forming a gently-sloping table-land, the stone being exposed in nearly vertical faces, protruding from the talus which has been developed as the face of the ledge has receded, owing to the action of the elements. Immediately below this limestone is found a deposit of Clinton fossil iron ore, generally occurring in small grains loosely cemented by gangue material. The workings of the Northwestern Iron Company exhibit this deposit in a most advantageous manner, for the capping of limestone is partially and in some places entirely absent, while the ore shows a thickness of 30 feet, dipping slightly under the plateau. The adjoining deposits are controlled by the Illinois Steel Company.

The following analyses of the ore will indicate its chemical composition:

Analyses of Hematite Iron Ore, Iron Ridge, Wis.

Metallic iron	51.09	48.82	47.32	50.96
Phosphorus	1.19	1.21	1.50	1.48
Silica	5.48	5.66	4.16	4.60
Lime	2.82	4.77	4.17	4.66
Alumina	5.27	5.13	6.00	undet.
Magnesia	2.43	1.31	undet.	2.73
Water	dried.	dried.	3.00	dried.
Manganese	undet.	....	trace.	trace.
Sulphur	....	....	trace.	undet.

The average composition as determined by the furnace yield is:

Metallic iron	48.3
Phosphorus	1.3
Silica	4.5
Alumina	5.0
Magnesia	2.0

The ore is practically self-fluxing. From the above it will be seen that the composition of the ore favor its utilization in producing steel by the basic method, and we believe it will before long be in demand for that purpose. As mined, or we should say dug—for mining the ore is little more than excavating a side hill cut in compact sand—the ore is in lumps; these readily break up in handling, or, if exposed to the weather, "slack" into sand composed of fine grains of red hematite fossil ore, whose size and color have given good reason for the local name "flaxseed ore." These grains are held together by a cementing material which was believed to contain most of the lime, silica and alumina found to be carried by the ore, but some investigations by Mr. F. H. Foote, superintendent of the Northwestern Iron Company's blast-furnace at Mayville, Wis., appear to prove that the cementing material, as well as the grains of ore, contain most of the component parts shown by the above analysis. Mr. Foote took samples of the ore for analysis, and then washed portions of them so as to have only the grains remaining, with little or no cementing material. The first three determinations were made by three different chemists of the ore as mined. They are marked A1, B1, C1. The next three are analyses of the same samples after washing, A2 being the washed ore from A1, B2 the washed ore from B1, &c.:

Analysis of Iron Ridge Ore, Wisconsin.

	Ore as mined.			Washed ore.		
	A1.	B1.	C1.	A2.	B2.	C2.
Iron	50.95	50.10	Und.	49.40	49.89	.....
Alumina	2.27	4.02	4.06	2.14	3.76	3.79
Silica	3.86	4.55	4.38	4.11	4.33	4.35
Ph'sphorus	1.35	0.81	1.06	1.81	0.85	1.88
Sulphur	Und.	0.01	Und.	Und.	Und.	Und.
Lime	Und.	6.28	Und.	Und.	5.66	Und.
Magnesia	Und.	1.11	Und.	Und.	1.36	Und
Volatile matter, carbonic acid, &c.	Und.	11.19	Und.	Und.	11.86	Und.
Moisture	Und.	.....	1.25	Und.	.....	0.67

Analyses A1 and A2 by Davenport Fisher, Milwaukee; B1 and B2 by Union Steel Works, Chicago; C1 and C2 by F. H. Foote, Mayville, Wis.

The tendency of the ore to "run ahead" of the balance of the charge in the blast-furnace encouraged its use with other ores, and satisfactory work was obtained using 50 per cent. of the Iron Ridge ore, although the other ores charged were soft hematites, and consequently composed largely of fine ore.

The location of this deposit, 50 miles north of Milwaukee, 30 miles inland from Lake Michigan and within 20 miles of Fond du Lac, at the head of Winnebago Lake, makes it accessible, and the cheapness of mining will before long bring it into demand. At one time a contract for 1,000,000 tons of this ore was made, and nearly 100,000 tons were mined and shipped in a year.

This interesting deposit, of which so little is apparently known by our metallurgists, probably approaches in extent and resembles somewhat the Minette ore of Luxemburg, of which a writer upon the German iron industry lately remarked: "Considerable alterations in the production of ore will be noticed in consequence of the invention of the basic Bessemer process, and it may be noted that the thick deposit of Minette in Luxemburg and Lorraine, which formerly had but a limited use, has attained a high and constantly increasing estimation. According to Mr. A. Jager, Minette consists of fine oolitic grains of brown hematite, cemented together by calciferous, argillaceous or siliceous masses.

"With less than 27 per cent. of iron Minette is not regarded as suitable for smelting purposes. Usually a mixture is employed, which renders the addition of lime as flux unnecessary, and yields 28 to 34 per cent. of iron. For export the higher grade ores are naturally preferred, and the average yield of the Minette exported to the lower Rhine and Ruhr may be taken at 38.5 per cent. of iron, with

about 10 per cent. of water. The amount of available ore in the Luxemburg-Lorraine deposit is estimated by Mr. Jager at 2,400,000,000 tons, being exceeded in size only by the clay iron-ore deposits of Cleveland. The total cost of production at some of the principal mines in 1881 was found by Jager to be 10d (22 cents) to 1/2½ (30 cents) per ton, and may now have slightly increased."

The Minette ore approaches in appearance the Iron Ridge ore, as far as the grains are concerned, but the Luxemburg ore has more cementing gangue than the Wisconsin ore, and consequently shows an average percentage of iron below that from the mines which we have described. If the German and Belgian iron-workers can utilize to advantage the deposit of Minette ore and find a constantly increasing market for it, we in this country should before long be able to make a considerable quantity of basic steel from the Iron Ridge deposit in Wisconsin.

THE BAY VIEW WORKS.

From the Mayville ore mines the special train made a rapid run to the Bay View Works of the Illinois Steel Company, near Milwaukee. The party was met at the works and escorted through them by Francis Hinton, the manager, and a number of the superintendents of departments. They were first taken to the blast-furnaces. These are two in number, each 16 x 60 feet. One of them was remodeled a short time since, equipped with a set of three Massick & Crooke's fire-brick stoves, each 18 x 65 feet, and was running on foundry iron at the time, having turned out in the previous week 1070 tons, which was expected to be shortly increased to 1100 tons, far exceeding its production in former days. The other stack is now being remodeled and equipped with a similar set of stoves and will be blown in some time next month. These furnaces use Lake Superior ores exclusively, with Connellsville coke as fuel. The blowing equipment consists at present of two Robinson, Rea & Co.'s vertical engines, and one Cuyahoga engine, to which another Cuyahoga engine is being added, which will give ample power. All ore housed under one roof. Batteries of flue boilers supply the steam, and the furnace gases are burned under them, with a new arrangement to mix air with the gas to secure proper combustion. A register is placed above the gas-flue to admit air to the top of the fire-box, the volume of which can be regulated by the register.

The visitors were next taken to the rolling-mills, where they witnessed the manufacture of angle-bars and saw the large punches in operation, punching four holes or slots at one time. Larger punches are used in the works elsewhere which punch six holes at one stroke. Improvements are shortly to be made in this mill for the purpose of increasing its productive capacity, which has been rendered necessary by the growing demand for the material which it turns out. A machine for making bottom plates for rails was examined, and the party thence proceeded to the merchant mill, in which all sizes of merchant iron or steel are produced. The steel is rolled from billets furnished by the Chicago works of the company, there being no steel plant at Bay View. The merchant mill building is a specially fine structure with stone foundation, brick walls and an iron roof, and is 300 x 160 feet. Oil is exclusively used for raising steam in this mill. The burners used are part Reid and part Chicago-Edwards burners. The oil is brought to the works in tank cars, which are then connected by pipes with the boiler furnaces, running to them by gravity from the cars, which are on elevated tracks. The oil is found to work better than coal, securing greater uniformity in producing the necessary heat and supplying more steam, which was demanded when the works began to manipulate steel extensively. Siemens gas-producers are used to make gas from coal for heating iron and steel in this mill. The warehouse was next visited, and the shipping facilities were found to be of the best. The floor of this house is on a level with the floors of the cars, which are run on a track alongside, and 18 cars can be loaded at one time. These works are running very full in all departments, but at the same time extensive alterations, improvements and additions are in progress, which have been found absolutely necessary.

Wednesday Evening.

The association had been invited to visit the Milwaukee Industrial Exposition, and accordingly this evening they set forth in procession from the Plankinton House, with the mayor of the city in the lead escorting one of the ladies in the party and with each member escorted by a citizen of Milwaukee. Arriving at the exposition building, not far away, they were received at the door by the exposition band, composed of most talented performers, who signalized their arrival with a magnificent burst of music. Entering the building, they received marked attention from the visitors to the exposition. Such an ovation is seldom accorded to a civic association. The exhibits were then examined and admired, the art-gallery receiving its due share of attention, and the exposition was unanimously pronounced a grand success, worthy of the enterprising city of Milwaukee.

Thursday Morning.

The morning was passed in visiting the Reliance Iron Works of Edward P. Allis & Co. The members hurriedly passed through department after department of this large establishment, examining machine-shops, foundries, erecting-shops, &c. They were found to be in a condition of most bustling activity. Among the notable pieces of work in hand were two blowing-engines of great power for the Illinois Steel Company. A large machine-shop is in course of erection which is being equipped with an electric traveling-crane of the firm's own design and construction, and which will be a most interesting piece of machinery when it is completed and in place. Although such a plant is like an omnibus, with room for "one more," it was stated that if no more orders should be received the work on hand is sufficient to keep it busy for over a year. The recent death of the founder of the firm, Edward P. Allis, is still fresh in the minds of the members of the trade, but the solidity with which he established the enterprise and the excellent business training which he gave his sons are demonstrated by the unchecked prosperity visible through all departments of these great works.

Thursday Afternoon.

This afternoon the members of the association were invited by the Association for the Advancement of Milwaukee to take a drive about the city to see the points of chief interest. This is an association of the progressive business men of Milwaukee, who have organized for the purpose of advancing the material interests of the city, with T. L. Kelly as president and C. M. Treat secretary. Carriages sufficient to convey the entire party, together with a citizen of Milwaukee in each carriage as a *chaperon*, were provided, and an extensive route was taken, leading through Juneau Park, past handsome residences on the bluffs overlooking Lake Michigan near the works operating the flushing tunnel for purifying the Milwaukee River, to the water-works which supply the city with water from Lake Michigan and which are equipped with large engines built by Edward P. Allis & Co., through numerous streets bordered with fine residences and imposing business structures, to the grounds of the Wisconsin State Fair, where a short stay was made to view some of the agricultural exhibits, and through the extensive grounds of the justly-celebrated Milwaukee Soldiers' Home. The free-hearted hospitality of Milwaukee made a profound impression on the members of the association, who carried away with them lasting recollections of the thrift, progress and bustling activity of this live city of 250,000 inhabitants. In the evening they departed for Ashland, on Lake Superior, by the Wisconsin Central Railroad, arriving there on Friday morning.

Friday Morning.

Refreshed by breakfast at the Chequamegon House, the members of the association soon afterward were driven in carriages to the Hinkle Furnace of the Ashland Iron and Steel Company, which has distinguished itself by turning out the largest production of pig-iron ever accomplished by any charcoal furnace in the world. The plant was fully described in *The Iron Age* of March 28. It continues under the management of M. R. Hunt, who first succeeded in demonstrating its capabilities as a producer of pig-iron. Since our description of the plant was published some changes have been made in minor details. An addition has been built to the boiler-house, containing a Heine safety boiler of the same size as the boiler in the first battery. The Spearman patent burner is used on this boiler. The supply of gas delivered from the furnace to the fire-chamber of the boiler is regulated by the sliding of the burner further back on a frame-work, thus enlarging or cutting off the passageway through which the gas enters the burner. The mechanism consists of a cog-wheel with a handle attached, the wheel being fastened to the burner and geared into a rack on the bed-plate. The casting-house has also been enlarged by the addition of some 20 feet at the end of it. The plant is further lighted by electricity furnished by the company's own dynamo. The furnace has but recently started on a new blast, having been blown in on the 8th inst. after a five-weeks' stoppage for relining and adding some of the improvements referred to. It is not as yet working up to its full capacity, its yield at present being from 80 to 85 tons per day, with the engine running at 17 to 20 revolutions per minute. During the last blast the production frequently exceeded 100 tons per day, and on one occasion 122 tons were made. About 80 bushels of charcoal are used to the ton of iron made, and 1¾ tons of Lake Superior ore are smelted to the ton of iron. Limestone is at present brought from Kelly's Island, in Lake Erie, being brought from that distant point and landed on the company's dock at a lower rate than Wisconsin limestone, besides being of purer quality. The visitors were well pleased with the fine appearance of this plant, its buildings being constructed mainly of brick and iron, while remarkable neatness prevailed throughout the entire establishment. The furnace is 12 x 60 feet, and is equipped with two Witherow-Whitwell fire-brick stoves, each 18 x 60 feet. The blowing-engine is of the vertical type, built by Edward P. Allis & Co., of Milwaukee.

Re-entering the carriages which were provided for the convenience of the party by the business men of Ashland, the visitors were driven through the principal streets of the city, which has grown very rapidly during the past five years, and were then taken to the ore-docks of the Milwaukee, Lake Shore and Western and the Wisconsin Central railroads. These docks extend 2000 feet into the Chequa-

megon Bay, an arm of Lake Superior, forming a beautiful natural harbor of great size and good depth and very easy of access from the lake. These docks handle the great bulk of the ore mined on the Gogebic range and shipped to lower lake ports. The Wisconsin Central have one dock and the Milwaukee, Lake Shore and Western have two docks. Each dock has 234 pockets for ore, the pockets being arranged on both sides of the dock to facilitate the loading of vessels. The largest dock has pockets holding 125 tons each, while the two others have pockets holding about 80 tons each. Railroad tracks run out to the ends of the docks, which are wide enough to accommodate two tracks to serve the pockets on each side. The docks are built high enough, about 40 feet from the surface of the water to their tops, to enable the bottoms of the pockets to be built far above the altitude of the decks of the vessels. The ore shoots into the latter through iron troughs, which are hinged to the dock and drawn up when not in use. A 2000-ton vessel is loaded with ore at these docks in five to six hours. The shipments of ore at all three docks for the week ending September 18 were 78,971 tons, while for the season up to that date the aggregate was 1,170,640 tons.

Friday Afternoon.

Through the courtesy of the citizens' committee the party enjoyed a steam-boat excursion on the Chequamegon Bay in the afternoon, the steam-boat being chartered specially for the occasion. The romantic scenery surrounding the bay was greatly admired, and the thoughtfulness of the citizens of Ashland in providing this treat for their guests was highly appreciated. The first landing was made on the north side of the bay at Houghton, where the quarries of the Prentice Brownstone Company were visited. They are located at the water's edge, enjoying most complete shipping facilities. The brownstone here lies in perfectly horizontal strata, and the supply is apparently unlimited. Eleven Vermont steam-channelers are used in cutting vertical seams through the stone, which is then split from the rock by steel wedges driven at the desired depth. The size of the block cut is limited only by the capacity of the transporting facilities. A very large stock of quarried stone awaits shipment, but the company state that they find the demand for it so heavy that they are at present only able to supply Western orders.

The tourists then proceeded further up the bay and landed on Madeline Island at La Point village, where Jesuit missionaries made their appearance only 21 years after the Pilgrims landed at Plymouth, Mass. The church erected by Father Marquette is preserved under the roof of a church built subsequently, and it was examined with eager interest as one of the few ancient relics in the very new Northwest. The party was photographed on the green sward in front of the church, near by a number of Indian groves. It was fast growing dark when the return trip was made.

Friday Evening.

Determined to dispense hospitality with an unstinted hand, the citizens' committee of Ashland had arranged for a banquet this evening at the Chequamegon House in honor of the association. A large number of the citizens, with their wives, participated in the festivities of the occasion, and played the *rôle* of hosts with charming grace and captivating sociability. All the arrangements were most admirable, the details of the banquet being carried out with a precision unlooked for in a place so remote from the large centers of population. Mayor H. H. Beaser acted as toast-master, introducing in a very appropriate address Dr. Edwin Ellis, who welcomed the association to Ashland and in eloquent terms dwelt upon the importance of the industry represented. President Bean and Secretary Birkinbine responded in most felicitous language, expressing the pleasure which was felt by all the members of the party at their most cordial reception and hospitable treatment, and dwelling upon the evidences of thrift and progress which were to be seen on every side in Ashland. The hour being very late it was decided to dispense with other speeches which had been arranged for and the banqueters dispersed to seek repose.

On Saturday morning the association left Ashland and arrived at Duluth shortly before noon, where they were received by a number of representative citizens.

PERSONAL.

J. H. Eames, of the Ajax Forge and Griffin Wheel and Foundry Companies, has resigned his position with these companies to take a similar one with the Allen Paper Wheel Company.

J. Bradt, who for more than a quarter of a century has been master mechanic on the Erie Railroad, has resigned. J. E. Sague, of the Jersey City shops, succeeds him.

Geo. W. Beale has resigned the position of superintendent of the Portland Locomotive Works, which he has filled for 20 years.

Major O. H. Ernst, who has been in charge of the Galveston, Texas, improvements, has been appointed Superintendent of Public Grounds and Buildings of the District of Columbia, in place of Col. J. M. Wilson, who has been appointed Commandant at West Point.

H. N. Burford, superintendent of motive power of the Texas and Pacific Railroad, died at Marshall, Texas, on the 6th. For 15 years before accepting the position he had been master mechanic of the Memphis and Charleston.

A. G. Menocal, chief engineer of the Nicaragua Canal, sailed for Greytown on the 21st. He was accompanied by J. Foster Crowell, who will fully examine the work.

Mr. John S. Fackenthal has resigned his position as superintendent of Pequest Furnace, at Oxford, N. J., and accepted a similar position with the Glendon Iron Company, at Easton, Pa., succeeding Mr. Janney, who resigned.

Mr. Andrew Carnegie, the well-known iron and steel manufacturer, was a visitor in Pittsburgh last week. While on the way to Pittsburgh Mr. Carnegie stopped at Johnstown, and learning that the public library of that city had been destroyed in the recent flood, he promptly agreed to defray the cost of erecting a new building. It is estimated to cost $30,000, and work will be commenced at once.

Frank C. Roberts has just returned from a visit to Western Tennessee, where he has examined an extensive iron ore and timber property in the interests of a Philadelphia and Chicago syndicate.

Dr. F. A. P. Barnard, the late president of Columbia College, has given his property to the college, the income of the estate going to his widow during her life.

We are informed that during the last week Tiffany & Co. shipped a handsome piece of plate, bearing a suitable inscription, to Düsseldorf, Germany. It was a testimonial offered to E. Schroedter, honorary secretary of their German hosts, by those American engineers who participated in the hospitalities at Düsseldorf from July 2 to July 6. Illuminated addresses were also forwarded to the Nieder-Rheinische Bezirks Verein des Vereins Deutscher Ingenieure and to the colliery proprietors, iron and steel manufacturers of the Rheinish Provinces, Westphalia and Luxembourg.

Angus Sinclair, secretary of the American Railway Master Mechanics' Association, has sailed for Europe, to be absent for some weeks. Business of the association which cannot be delayed should be transacted with R. H. Briggs, president, of Memphis, Tenn.

The Peekskill Bridge.—There is renewed activity in the work of building the projected new Hudson River bridge between Fort Clinton and Anthony's Nose, near Peekskill. The corporation who have undertaken the work are known as the Highland Bridge Company. Gen. Edward W. Serrill is president and chief engineer. The company have recently paid the West Shore Railroad $100,000 for moving their tracks at Fort Clinton 20 feet further back from the river, to make room for the bridge abutments and anchorage. The West Shore have so far completed the work that the bridge company have set a large force at work building the western abutments and sinking the anchorage pits. Another gang is at work on the abutments at Anthony's Nose. Surveyors are locating the line of railroad that is to connect the new bridge with the Erie Railroad at Turner's Station, and a gang of men has been set at work excavating the 500-foot tunnel required at Bull's Hill, on this new road. The promoters of the project claim that they can successfully compete with the Poughkeepsie Bridge people for the Pennsylvania and New England coal traffic, and they promise to have their bridge completed within two years.

A meeting of the subscribers to the capital stock of a new sugar-refining company has been held at Baltimore, and it is stated that of the capital stock of $1,000,000 required, $777,000 has been subscribed and enough promised to make $800,000 paid-up stock. The company have been organized, with W. W. Spence president and Frank Frick, Joshua Levering, Rufus Woods, William P. Harvey and William S. Rayner, of Baltimore, and Theodore H. Kraft and Bernard Gallagher, of New York, directors. The refinery buildings will be erected at Curtis Bay, the tidewater terminus of the Baltimore and Ohio Railroad, a few miles from the city.

The case of the American Wire Nail Company, of Covington, Ky., against the New Orleans and Texas Pacific Railroad was practically settled before it reached the Interstate Commerce Commission at St. Louis. The complaint was based on the difference in rates charged for wire nails and cut nails.

The committee appointed by the Master Mechanics' Association to consider the question "Tires; the advantage or otherwise of thick tires," recommended that "tires 3 inches in thickness, of the best quality of material, would be the best and most economical for railroad purposes."

The Thomson-Houston Electric Company have issued a circular calling a special meeting of stockholders at New Britain, Conn., on September 28, to decide if the common stock shall be increased from 120,000 shares to 180,000 shares of the par value of $25 each, and to see if the stockholders will change the place of holding annual and special meetings to some other town in Connecticut.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, September 23, 1889.

Pig-Iron.—The demand for Iron is great and increasing for the cheaper grades of Foundry and Soft Irons. The inability on the part of consumers to get what they need multiplies the inquiries and exaggerates the actual amount of material wanted. If furnace men would supply consumers with small lots at current prices instead of withdrawing from the market and endeavoring to force higher prices on a partly fictitious basis there would in all probability be sufficient Iron, if distributed according to necessity, to meet all immediate requirements. As it is there is a large portion of the consuming class who have little or no stock, and to obtain what circumstances compel them to buy they are required to pay from 50¢ to $1 ℔ ton more for inferior grades than standard brands of the same class would be sold at if the Iron could be had. Under these conditions Southern manufacturers are reaping the greatest benefit, especially on White and Mottled Iron, wanted for puddling. Charcoal Irons have begun to move more freely and prices have been advanced 50¢ ℔ ton. Coke Irons are firm and local brands are in very short supply. The makers, however, do not deem it expedient to advance their prices simply because they have no Iron to sell. Ohio Softeners, Southern Foundry Charcoal Iron, could be sold in large quantities if time of delivery and prices were satisfactory. All consumers are taking their Iron as rapidly as contracted for, while many are asking for shipments in advance of specified deliveries, showing that the Iron is going into manufactured goods and not called for on speculative prospects. A rumor that the Illinois Steel Company are about to close a purchase of 20,000 tons of Bessemer Pig is circulated, but not confirmed. It is said that manufacturers of Bessemer Irons are asking $17.50 at Ohio furnaces. If this price is strictly adhered to it will be equivalent to an advance of $1 ℔ ton over previous prices. The following prices are named, cash, f.o.b Chicago: Bessemer, $19 @ $19.50; Lake Superior Charcoal, $19 @ $19.50; Local Coke, No. 1, $16.50 @ $17; No. 2, $15.50 @ $16; No. 3, $15; Chicago and Bay View Scotch, No. 1, $16.50 @ $17; American Scotch (Blackband), No. 1, $19.50 @ $20; Jackson County, No. 1, $18; Hanging Rock, No. 1, $18.50 @ $19; Southern Coke, No. 1, $16.75; No. 2, $16.25; No. 3, $15.75; No. 1, Soft, $16.25; No. 2, Soft, $15.25; Gray Forge, $15.50; Mottled, $15; White, $14.50; Tennessee Charcoal, No. 1, $18.50 @ $19; Alabama Car-Wheel, $22 @ $24.

Bar-Iron.—The demand for immediate consumption is greater than the mills can supply. There is also a good sprinkling of orders for November and December delivery. On the latter makers refuse to quote. On immediate deliveries manufacturers who can take orders are asking 1.70¢ Common Iron at mill on the general run of orders and 1.65¢ on those considered extra desirable in size and time of shipment. Upon some specifications 1.80¢ flat, f.o.b. Chicago, has been named as bottom. From store jobbers quote 1.90¢ for Common Iron to the largest trade and 2¢ to the smaller trade. Jobbers are having great difficulty in keeping up their stock, and are forced to "back order" many of their large sales.

Structural Iron.—Contractors are making a great rush to get work under roof before bad weather sets in, and consequently dealers and foundries are being gibed on delays and importuned for material that cannot be had. Prices from mills are as follows, f.o.b. Chicago: Angles, 2.25¢ @ 2.35¢; Universal Plates, 2.40¢; Sheared Plates, 2.45¢ @ 2.50¢; Tees, 2.65¢ @ 2.70¢; Beams and Channels, 2.90¢. Small lots from store: Angles, 2.40¢; Tees, 2.70¢ @ 2.75¢; Beams and Channels, 3.40¢.

Plates, Tubes, &c.—The large stock of Plates and Sheets that jobbers had on hand in June are materially reduced. Mills cannot supply the demand from regular customers with any degree of promptness. The excellent demand for Tubes has absorbed pretty much all the stock and manufacturers have made another advance in prices. Boiler-Tubes are now quoted at 50 % off on 1¾-inch and less, and 55 % off on 2-inch and upward. From store the following quotations are made: Iron Sheets, Nos. 10 to 14, 2.80¢; Steel do., 2.80¢ @ 3¢; Tank, Steel and Iron, 2.60¢ @ 2.70¢; Shell Steel, 3¢; Flange, 3.50¢; Fire-Box, 4.25¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler-Rivets, 4¢ @ 4.25¢. In carload lots manufacturers make the following prices f.o.b. Chicago: Nos. 10 to 14 Iron Sheets, 2.65¢; Nos. 10 to 14 Steel Sheets, 2.75¢; Tank Iron, 2.50¢; Tank Steel, 2.60¢.

Sheet-Iron.—There is no change in the condition of this market. There are plenty of orders for large and small lots and prices are firm at 3.10¢, at mill, for No. 27. From store jobbers quote on a basis of 3.40¢ for No. 27 for small lots and 10¢ ℔ 100 lb off on large orders.

Galvanized Iron.—Business continues very good and prices gradually improving. A jobber remarked that he did not know of anybody who would sell at less than 67½ % off and was not sure that much could be had at that price. From store small lots are quoted at 65 % and 5 % off on Charcoal. Manufacturers are now of the opinion that about the time the season's trade is over prices will have advanced to a remunerative basis.

Merchant Steel.—Trade is very good on the whole line, but especially so for Soft Steel Bars. The advance in Iron is increasing the demand for Steels that can be used in place of Iron and not add too much to the cost of the manufactured article. Makers quote as follows, f.o.b. Chicago: Spring and Tire Steel, 2.25¢ @ 2.40¢, flat; Toe Calk, 2.30¢ @ 2.50¢; Open-Hearth Machinery, 2.20¢ @ 2.30¢; Bessemer Machinery, 2.15¢ @ 2.20¢. From store jobbers quote: Mild Machinery, 2 25¢ @ 2.35¢; Bessemer Machinery, 2.40¢ @ 2.60¢; Open-Hearth Machinery, 2.70 @ 3¢; Tire, 2.40¢ @ 2.50¢; Tool, 7.50¢ @ 8.50¢; Sheet, 7¢ @ 10¢.

Steel Rails.—There continues to be a very urgent demand for blocks of Rails for October and November delivery. No orders can be taken here for October and only a limited quantity for November and December. The Illinois Steel Company have advanced their price to $33, at mill, for Heavy Sections and to $36 for 30-lb and 35-lb Rails on such quantities as they can deliver during the last two months of the year. They are not yet prepared to name prices for next year's delivery, but are having a great many inquiries for round lots, the aggregate quantity being nearly 150,000 tons. These orders are almost entirely from railroads in the Western territory. There appears to be a general inclination to have orders booked immediately, as the opinion prevails that there will be an extraordinary demand for Rails next season.

Track Supplies.—The surplus stocks of Track Fastenings that railroad companies had in store are exhausted, and their dilatory tactics in placing orders causes them unexpected trouble now. In the past three months it was a general remark that these odds and ends could be obtained at any time at low figures on account of competition and that they did not wish to place orders until they needed the material. They are now hustling to get their orders filled, and find mills full of work and advancing prices. Quotations are as follows, f.o.b. Chicago: Steel Splice-Bars, 1.95¢; Iron ditto, 1.90¢; Spikes, 2¢; Bolts, Square Nuts, 2.60¢ @ 2.65¢; Hexagon, 2.75¢ @ 2.80¢.

Old Rails and Wheels.—As puddling increases among the Bar mills the demand for Old Iron Rails decreases, and to this fact, together with the high prices, is attributed the increased offerings of the past week. Sales are reported at $24.75 @ $25, with some offered at the latter figure and no buyers. There is a fair demand for Old Steel Rails. Short lengths are quoted at $16.50 @ $17 and long lengths at $18.50 @ $19. Old Car-Wheels were sold during the week at $18 @ $18.25. The quantity that can be had at these figures is limited. Stocks are being picked up by speculators who are waiting for higher prices. Compared with Charcoal Pig-Iron the price is now abnormally high.

Scrap-Iron.—There is more inquiry for No. 1 Wrought and Mill Scrap. Those who have the stock on hand are not inclined to make sales at prices offered. For a lot of 1000 tons of No. 1 Forge brokers have offered $19.50. Dealers' quotations are as follows, per net ton: No. 1 Forge, $19.75 @ $20; No. 1 Mill, $14.50 @ $15; No. 2, $10 @ $10.50; Car-Axles, $24.75; Splice-Bars, $21; Horseshoes, $19; Locomotive Tires, $17; Wrought Pipe, $14; Leaf Steel, $16; Coil Steel, $15; Wrought Turnings, $12; Axle Turnings, $13; Cast Machinery, $12; Stove-Plates, $9; Cast Borings, $9; Wrought Borings, $10.50; Mixed Country Scrap, $15.

Hardware.—Trade in all lines of Hardware is very good. The leading houses have all they can do, while the smaller houses complain that trade is not up to their usual September business. The advance on some lines has made dealers hesitate in placing their orders until they can determine whether the advance has come to stay. Chicago jobbers have not yet advanced their prices on many articles to correspond with the changes made by the manufacturers, but will likely do so this week.

Nails.—Nail-makers are now asking $2 ℔ keg at mill for Cut Steel Nails. Jobbers quote them from store in small lots at $2.10, and in carloads at $2.05. This price will be advanced within a few days, as new stocks cannot be laid down here for less than $2.10 @ $2.15 under the most favorable conditions. Wire Nails are quoted at $2.25 at the factory, which would be $2.40, f.o.b. Chicago. From store jobbers are asking $2.45 in small lots and $2 40 in carloads. Trade is good, and higher prices are predicted.

Barb-Wire.—As trade improves prices become stronger Quotations as yet are no higher, but manufacturers are asking jobbers more money for their product on future deliveries. Painted Wire is quoted at 2.75¢ in carloads, and 2.80¢ in small lots. Galvanized is held at 60¢ advance on these figures. Jobbers are likely to advance prices very soon.

Pig Lead.—Transactions of some 300 tons are reported at prices ranging from 3.80¢ to 3.90¢. Toward the close of the week offerings were plenty at 3.80¢ for near future delivery.

The Minerva Furnace, at Milwaukee, has been leased to Forsyth, Hyde & Co., Chicago, and several other parties, who will organize a company, to be known as

the Minerva Furnace Company, for the purpose of operating the furnace. The capacity of the furnace is about 70 tons per day. Considerable quantity of Ore has already been delivered, and the furnace will start up on Foundry Iron as soon as the Coke, which is on the way, is received. The product will be sold by Messrs. Forsyth, Hyde & Co., Randolph and Dearborn streets, Chicago.

Matthew, Addy & Co., Cincinnati and Chicago, have been appointed exclusive sales-agents for Tecumseh Warm-Blast Charcoal Iron, which is manufactured at Tecumseh, Ala. Mr. S. H. Fernandez, their Chicago agent, with office in the Rookery Building, says that the Iron is especially adapted for foundry and Car-Wheel purposes.

Mr. Charles Barnes has been appointed manager of Park Bros.' branch house in Chicago. Mr. Barnes has been connected with Parkhurst & Wilkinson, of this city, during the past 17 years, and is well and favorably known among the Iron and Steel consumers throughout the West.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., September 24, 1889.

Pig-Iron.—There has been no change of importance since date of our last report. In spots the market seems to be a little stronger, but this is offset by the offerings of odd lots, new brands, &c. Really desirable brands are firm and scarce, the current output being fully taken up by deliveries on old contracts, leaving little or no surplus for new demands. This is more especially true of Mill Irons, although good Foundry Irons are by no means plentiful. This naturally leads to a wide range of prices—a premium on such brands as consumers most prefer, while more or less of a discount is necessary to secure sales on brands not known or on those not classed as strictly standard quality. Hence it is quite true that there are Mill Irons for sale at $15, delivered at tide, No. 2 Foundry at $16 and No. 1 at $17, but a fair average of the market would be at least 50¢ more than these figures, and for favorite brands another 50¢ and sometimes $1 on top of that. The general position of the market, however, is practically the same as last week, although if the surroundings are taken into account somewhat higher prices are not improbable in the near future. The buoyancy of the Western markets, the advance in fuel and other items of cost, combined with the close margin between supply and demand, are all admonitory features, and may easily develop a very active market, and with that a higher range of prices than the trade have yet begun to look for. However, there is a conservative feeling on all sides, so that there is not much chance for anything beyond what may be called strictly legitimate prices.

Foreign Iron.—Prices abroad are too high to permit of much business being done on this side, although 20 % Spiegel has been sold at $32, c.i.f., duty paid, and is now held at $32.50. Ferromanganese has been sold at $71, c.i.f., duty paid, for 80 %, and is now held firm at $72.50. Special brands of Bessemer are quoted at $23.50 @ $24, c.i.f., duty paid.

Blooms.—The same general conditions prevail as noted for some weeks past—viz. irregularity in prices, and difficulty in getting sellers to quote on large lots. But on the whole prices are higher, probably $1 higher on an average, but all depends on circumstances. The mills are undoubtedly very full of orders, and this fact alone makes buyers doubly anxious to secure options, as there is a general belief in higher prices. As a rule, sales during the week have been based on quotations as follows, say: $31 @ $32, delivered, for Nail Slabs; $32 @ $33 for Sheet or Tank; $36.50 @ $37 for Shell; $39 @ $40 for Flange, and $41 @ $43 for Fire-Box; Charcoal Blooms, $52 @ $54; Run-out Anthracite, $42.50 @ $43.50; Scrap Blooms, $32.50 @ $33.50 ℔ "Bloom" ton of 2464 lb

Muck-Bars.—Business during the week has been very light, and opinions vary as to the exact position. But a good deal depends on whether one wants to buy or to sell. Parties who are in the market as buyers at $29.50 @ $29.75, Philadelphia, say that they have not been able to place their orders, while sellers (with nothing to offer) claim that $29.50 @ $30 are full quotations. As a matter of fact, we hear of no recent sales, but good Bars would be likely to command about $30, Philadelphia or its equivalent.

Bar-Iron.—The market has been a little quiet during the past few days, but prices have not varied materially from the figures quoted in our last review. Mills are in most cases full of work, so that there is no necessity for accepting new business unless on terms that are entirely satisfactory; and as cost of production has increased considerably it is hardly likely that concessions will be granted so long as the outlook for consumption remains as favorable as it now is. Prices are irregular, nevertheless, but for really good Iron 1.85¢, at mill, is usually a firm quotation; some are firm at 1.90¢ @ 1.95¢, but their order-books are full, so that in any case they could hardly make deliveries inside of two or three months. Against this must be placed the fact that a few outside mills have been offering what they claim to be good bars at 1.80¢, but there is more or less doubt as to quality. Skelp Iron is dull, and buyers have reduced their bids to 1.80¢ for Grooved and about 2.10¢ for Sheared, but sellers are firm at 1.85¢ and 2.15¢ and upward according to sizes.

Plates.—The demand is not specially heavy, but mills have so much work on hand that they could not undertake much more without incurring some risks. Prices of Raw Material are advancing, as well as other items of cost, and higher prices for the finished article may become necessary in a little while, but for the present, and for such deliveries that can be made soon, manufacturers quote about as follows, say: 2.15¢ @ 2.20¢, delivered, for Ordinary Plates and Tank Plates; 2.25¢ @ 2.30¢ for Universal Plates; Shell, 2.5¢ @ 2.6¢; Flange, 3.25¢; Fire-Box, 3.75¢ @ 4¢; Steel Plates, Tank and Ship Plate, 2.30¢ @ 2.40¢; Shell, 2.6¢ @ 2.7¢; Flange, 2.8¢ @ 3¢; Fire-Box, 3½¢ @ 4¢.

Structural Material.—There is not much change in this department, but prices are gradually working toward a higher level. No large amount of new business has been entered recently; but there is plenty of work in hand, with still more in sight, so that the utmost confidence is felt in regard to the future. Prices are about as follows (but may be advanced almost at any time): Bridge Plate, 2.25¢ @ 2.30¢, delivered; Angles, 2.15¢ @ 2.25¢; Tees, 2.6¢ @ 2.7¢; Beams and Channels, 2.8¢ for Iron or Steel, all delivered at Philadelphia or its equivalent.

Sheet-Iron.—A continued good demand is reported for all descriptions of Sheets, but there is no change in prices, which remain as follows for carload lots:

Best Refined, Nos. 14 to 20	3¢
Best Refined, Nos. 21 to 24	3.20¢
Best Refined, Nos. 25 to 26	3.40¢
Best Refined, No. 27	3.50¢
Best Refined No. 28	3.60¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20	3¼¢
Best Soft Steel, Nos. 21 to 24	3½¢
Best Soft Steel, Nos. 25 to 26	3¾¢
Best Soft Steel, No. 27	4¢

Best Bloom Sheets, ¼¢ extra over the above prices.

Best Bloom, Galvanized, discount	65 %
Common, discount	67½ %

Steel Rails.—Prices are strong at the advance noted in our last. Some large orders have been taken, presumably on options that were given some time ago. The asking price is now $30 at mill, and with the continued advance in material it is thought that still higher figures will be required in the near future.

Old Rails.—There is not much doing, but prices are as firm as ever. The available supply is very light, and only small lots can be picked up at from $25 to $25.50, delivered in consumers' yards. Lots on the sea-board are held at equally high figures, so that business is very much restricted.

Scrap-Iron.—Prices are firm, but owing to small offerings sales have not been of much importance. Usual quotations about as follows: $21 @ $21.50 for cargo lots; $22 @ $22.50 for carload lots, delivered; or for choice, $23; No. 2 do., $15 @ $16; Turnings, $14 @ $15; Old Steel Rails, $16.50 @ $17.50; Cast Scrap, $15 @ $16; do. Borings, $9 @ $10; Old Fish-Plates, $25 @ $26.

Nails.—The demand is not large, neither are prices as firm as they ought to be, considering the increase in cost, &c. Sales in carload are made at about $1.90 and lots from store at $2. The advance in cost since midsummer is at least 15¢ ℔ keg, with prospects of a still further movement in the same direction, so that a sharp advance in prices may be made at any moment, and cannot any way be delayed very much longer.

Wrought-Iron Pipe.—The demand continues to be satisfactory, and mills are pretty well filled up with orders for the fall trade. Discounts same as last week, except slight changes in Boiler-Tubes, as follows: Butt-Welded Black 50 %; Lap-Welded Black, 62½ %; Butt-Welded Galvanized, 42½ %; Lap-Welded Galvanized, 50 %.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,
CHATTANOOGA, September 23, 1889.

Pig-Iron.—The condition of the market has not been as even and uniform as previously reported. From some of the furnaces there appears to have been an unusual demand, while from others a falling off, which has caused some irregularities of quotations, and quite a number of sales have been made at different prices for the same grade. Upon an average, prices have advanced a little, and the general feeling appears to prevail that prices will go higher. Inquiries are even more numerous for round lots of Foundry, to be delivered during October and November. Further than this, the furnaces are quite reticent in quoting, although a few sales of round lots have been made to run during the year and into January and February. Some of the furnaces are refusing to quote at any reasonable figure, as they are sold up for two or three months and think they can wait on further developments of the market. So far as the stocks in furnace hands are concerned, there has been a gradual decrease for the past six weeks, and another month at the same rate will see but little on hand in first hands. The demand for Foundry from Southern consumers has been steady. Taking the new plants that have gone into operation during the year and the increase in consumption of the old ones, there is probably 30 % more Pig melted by the Southern foundries at the present time than a year ago. To prices of Nos. 1 and 2 Foundry may be added a few points over quotations a week ago.

Louisville.

LOUISVILLE, KY., September 21, 1889.

The market is very strong, and buyers find furnaces not willing to sell at old prices longer than 60 days' delivery; for deliveries extending over a greater period an advance of 50¢ ℔ ton has been asked. Mill Irons are especially scarce, and from a careful canvass of the Southern furnaces it is believed there will be considerable difficulty in obtaining these grades for prompt shipment, even if the furnaces' views of prices are met. Almost all furnaces are sold largely up to the balance of the year, and are not willing to accept large orders for long deliveries at any price, as they wish to defer selling until the market becomes settled and it is decided what are current prices for Iron. Where sales have been made full market prices have been obtained, and in some instances an advance of 50¢ a ton over prices current last week has been asked and accepted. Several thousand tons Gray Forge were sold in this vicinity on a basis of $15.75 and 2000 tons No. 1 Foundry sold at $15.

Southern Coke, No. 1 Foundry (new classification)	$15.00 @ $15.50
Southern Coke, No. 2 Foundry (new classification)	14.50 @ 15.00
Southern Coke, No. 3 Foundry (new classification)	13.75 @ 14.25
Gray Forge	13.25 @ 13.75
White and Mottled, different grades	12.75 @ 13.25
Silver Gray, different grades	13.25 @ 13.75
Southern Charcoal, No. 1 Foundry	16.50 @ 17.00
Southern Charcoal, No. 1 Mill	15.00 @ 15.50
Southern Car-Wheel, standard brands	22.00 @ 23.00
Southern Car-Wheel, other brands	18.25 @ 19.75
Hanging Rock Coke, No. 1 Foundry	15.75 @ 16.25
Hanging Rock Charcoal, No. 1 Foundry	19.75 @ 21.25
Hanging Rock, Cold Blast	21.00 @ 23.00

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, September 23, 1889.

Pig-Iron.—The strong tone of the market is being firmly maintained and sellers evince more confidence with every sale. Full prices are asked and requests for concessions are not entertained whatever; in fact, in some cases buyers are only too anxious to have their orders filled at reasonable figures, and the question of delivery plays a more prominent part to a certain extent than do prices. We do not wish to create the impression that a Pig-Iron famine is imminent, but it is a well-known fact that a number of furnaces have sold their product three months ahead and are consequently out of the market. Those who have Iron for sale—and these are few, comparatively speaking—are quick to see the advantageous position they hold, and are consequently disposed to ask higher figures, in some cases 25¢ and others 50¢, according to circumstances, and very little trouble is experienced in securing the advanced figures, as buyers are disposed to contract for enough Iron to cover their wants for the balance of the year. Consumption keeps up at a remarkable rate, and it is doubtful if the foundries, machine-shops, &c., have ever experienced a more busy season than the past two months; and unless something unforeseen occurs this state of affairs is likely to prevail for an indefinite period. Sales during the past week have been heavy and at prices that are fully 25¢ over those of the week immediately preceding it, and from present indications further advances are quite probable. For ordinary-sized lots we quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry,	$16.00 @ $16.50
Southern Coke, No. 2 Foundry,	15.25 @ 15.75
Southern Coke, No. 3 Foundry,	14.75 @ 15.00
Gray Forge	14.25 @ 14.50
Ohio Softeners	17.00 @ 19.00
Lake Superior Charcoal	20.00 @ 21.50
Missouri.	
Charcoal Foundry, No. 1	16.25 @ 16.50
Charcoal Foundry, No. 2	15.00 @ 15.50
Tennessee.	
Charcoal Foundry, No. 1	18.00 @ 18.50
Charcoal Foundry, No. 2	17.00 @ 17.50

Connellsville Coke, f.o.b. East St. Louis, $4.85; St. Louis, $5.

Bar-Iron.—The local trade is unusually brisk and the mills are unable to keep up with their orders, and it is doubtful if a mill could be found to take any kind of a large order and guarantee immediate delivery. Prices are firm and are advancing. A prominent mill refused to accept 1.85¢ and mentioned 1.90¢ as the lowest possible price that would be accepted. Store price has been advanced from 1.90¢ to 2¢, at which figure it is very steady.

Barb-Wire.—The demand for Barb-Wire is daily increasing, and consequently mills have all they can do to fill orders. Prices are being firmly maintained, and further improvement in this direction is assured by October 1, as the recent advance does not begin to cover the increased cost of raw material. For the present we quote as follows: Painted, in small lots, from 2.85¢ to 2.90¢; Galvanized, 3.40¢ @ 3.45¢; carload lots Painted, 2.80¢ @ 2.85¢; Galvanized, 3.35¢ @ 3.40¢.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts. CINCINNATI, September 23, 1889.

Pig-Iron.—Less activity has visited the local market for Pig-Iron during the week, but there has been no loss of strength. Higher prices have been realized on some grades, and at the close a further advance is asked, with much confidence expressed in its attainment in the near future. Consumption is large and increasing, while stocks are steadily decreasing, encouraging furnaces to withdraw from the market in expectation of more remunerative rates; in fact, many Southern stacks have been compelled to cease selling, being already heavily oversold for this year's delivery and some orders of moment booked for the early months of next year. Buyers, however, have been less anxious to buy and have not followed the last advance demanded, gathering assurance from the fact that production is increasing and believing that many large consumers have anticipated their wants for three or four months, prompted by the rapidly advancing market. Foundry Iron, both Coke and Charcoal, has more closely followed Mill Iron, which is scarce. Softeners and Mottled Iron have met a fair inquiry, and Car-Wheel Iron has sold fairly well, but no advance has been realized on the latter grades, although Lake Superior furnaces now ask 25¢ @ 50¢ more on their brands. Among the larger sales during the week were: 3000 tons Gray Forge, at $14; 1500 ditto at $14, and at the close $14 is bid, with sellers at $14.15, cash, here; 1000 tons No. 3 Foundry (Southern) at $14.50, and moderate amounts of No. 2 ditto at $15; 2000 tons Southern Car-Wheel at $23.50, and 1600 tons Lake Superior Car-Wheel at $19.75, cash. The following are approximate prices current here at the close for cash, f.o.b.:

Foundry.	
Southern Coke, No. 1	$15.75 @ $16.00
Southern Coke, No. 2	15.00 @ 15.25
Southern Coke, No. 3	14.50 @ 14.65
Ohio Soft Stone Coal, No. 1	16.00 @ 16.75
Ohio Soft Stone Coal, No. 2	15.00 @ 15.75
Mahoning and Shenango Valley	16.00 @ 16.75
Hanging Rock Charcoal, No. 1	20.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.00 @ 21.50
Tennessee and Alabama Charcoal, No. 1	17.50 @ 18.50
Tennessee and Alabama Charcoal, No. 2	16.50 @ 17.50
Forge.	
Gray Forge	14.00 @ 14.25
Mottled Neutral Coke	@ 13.50
Car-Wheel and Malleable Irons.	
Southern Car-Wheel	23.00 @ 24.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	20.00 @ 20.50

Manufactured Iron.—There has been no abatement in the business at the mills and shops, but new orders have possibly been less liberal; yet, with large old orders, there is no lack of confidence.

Nails—Have met a better demand and a strong tone has prevailed. Iron and Steel Nails, 12d to 40d, sell at $1.95 @ $2 ℔ keg, with 10¢ rebate in carload lots, at the mills. Steel Wire Nails sell at $2.35 @ $2.40 for 60d.

Old Material.—There has been a better demand for Old Rails and a firm tone has prevailed, with sales of 500 tons at $24, cash, Cincinnati, and other sales at $26 in "the valley." Old Wheels have been quiet and nominal at $19, spot cash.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave. PITTSBURGH, September 24, 1889.

There has been renewed activity in the general Iron and Steel industries. Not only has there been an increased demand for almost everything in the lines noted, but prices are again on the upward turn. It was thought a couple of weeks ago by a good many well-informed operators that there would not be much change in the general situation during the remainder of the year, but the events of the past week have proved the contrary. It appears that the demand for Finished Iron and Steel has been much larger than was generally expected, the effect of which has been to increase the inquiry for all kinds of raw material. The demand for new Steel Rails, for instance, within the past few weeks has exceeded the expectations of the most sanguine. The effect has been to increase the demand for Bessemer Pig and Billets, and prices for all kinds of Bessemer Steel have been advanced. There was never, perhaps, such a demand for Wrought-Iron Pipe as there has been since early in the summer, and many mills here as well as elsewhere have had all they can do in making Pipe Iron.

As noted in a former report, the railroads are large buyers, directly as well as indirectly. The large contract made recently for Rails carries with it a big demand for all kinds of railroad supplies, and in addition to the new roads now in process of construction, nearly all the older companies are making extensive repairs and improvements and increasing their rolling-stock. All the car shops and locomotive works in the country are as busy as they can be. The P. R. R. have given out contracts for thousands of new freight-cars, and notwithstanding their immense capacity for doing business, they find themselves unequal to the present emergency.

Pig-Iron.—There has been an increased demand during the week under review, and most of the sales of Mill Iron reported show an advance of 25¢ @ 35¢ ℔ ton. Several large sales are reported, mostly for future delivery. Included in the sales were several lots of Southern Mill at $15.50, cash, or 25¢ @ 50¢ ℔ ton below the price now demanded for home-made Irons. It is said that furnace men have succeeded in getting better freight rates and that they are therefore better enabled to enter the Northern market with their product. We quote prices as follows:

Neutral Gray Forge	$15.50 @ $15.85, cash.
All Ore Mill	16.00 @ 16.50, "
White and Mottled	14.50 @ 15.00, "
No. 1 Foundry	17.00 @ 17.50, "
No. 2 Foundry	16.00 @ 16.50, "
No. 2 Charcoal Foundry	21.50 @ 22.00, "
Cold Blast Charcoal	25.00 @ 28.00, "
Bessemer Iron	18.00 @ 18.30, "

There have been no sales of Forge reported as yet at $16, cash, but it is probable that it will be realized before the close of the present week. Sales of 2500 tons Bessemer were reported at $18.25 @ $18.30, cash, and some furnaces are now refusing to accept less than $18.50, cash.

Spiegel.—The market is strong and considerably excited, both for Spiegel and Ferromanganese, and within the past week prices have still further advanced. There have been no sales reported recently, and it is difficult to give reliable quotations in consequence, but certain it is the market is away up.

Muck-Bar.—There has been an increased demand developed during the past week, with sales reported at $28.50, cash; there are now but few sellers below the price quoted, and some are refusing to accept less than $29. The surplus which had been accumulated in some quarters appears to have been worked off, and the demand is now fully equal to the supply.

Manufactured Iron.—Demand continues good for all kinds of Finished Iron and prices are strong, in sympathy with the raw material. The mills are all busy, and many of them are refusing to contract for future delivery at present prices. They will book orders with the understanding that they are to obtain ruling prices at time of delivery, whatever they may be. We quote Bars at 1.80¢, 60 days, 2 % off for cash; Plate-Iron, 2.25¢ @ 2.30¢; No. 24 Sheet, 2.85¢ @ 2.90¢; Skelp Iron, for which the demand is more urgent than any other kind, may be quoted at 1.80¢ @ 1.90¢ for Grooved and 2 10¢ @ 2.20¢ for Sheared.

Nails.—We have to report a considerably stronger market for Cut Nails, with an increased demand, as is always the case when the prices are tending upward, and manufacturers are refusing to contract ahead at present prices. We now quote at $2, 60 days, 2 % off for cash. The greatly enhanced cost of Nail Slabs has largely increaeed the cost of production, and a further advance soon is not improbable. There is considerable talk in regard to reorganizing the Western Nail Association.

Old Rails.—The market for Old Rails continues strong, and with considerable inquiry and light offerings prices are still tending upward. We are reported sales of some 1300 tons at $26 @ $26.25. At the prices asked at some sources of supply they would cost considerably more than prices above quoted laid down in Pittsburgh, and a further advance is altogether probable. Old Steel Rails are also in better demand and firmer. We now quote at $19 @ $19.50 for short and $20.50 @ $21 for long pieces.

Billets, Blooms, &c.—There appears to be no abatement in the demand for Bessemer Steel Billets, and as the mills are all oversold brokers report that it is almost impossible to place an order either for present or near-by delivery. Prices are still tending upward, and are now quoted at $31 @ $32, cash, as to size, quality and delivery. Nail Slabs, $30.50 @ $31. Rail Crops, in the absence of sales, may be quoted at $20.50 @ $21, and Bloom Ends at $19.50 @ $20. For immediate delivery higher prices than those quoted might be realized.

Steel Rails.—The market for Rails is also firmer and higher. We now quote at $31, cash, at mill, for delivery during the remainder of the present year. Sales were made not very long ago at $30. Mills here, as elsewhere, are pretty well sold up.

Railway-Track Supplies.—There is an increasing demand and it is probable that prices will be advanced, in sympathy with the enhanced cost of raw material. Spikes are still quoted at 2.10¢, 30 days, on cars at works in Pittsburgh; Splice Bars, 1.80¢ @ 1.85¢; Track Bolts, $2.75 @ $2.85.

Old Material.—There is an increasing demand and prices are stiffening. No. 1 Wrought Railway Shop Scrap, $20.50 @ $21, net ton; Wrought Turnings, $13 @ $14; Car Axles, $25 @ $26; Cast Scrap, $15, gross; Old Car-Wheels, $18 @ $18.50.

Samuel W. Hay, Iron and Steel broker, located in the Hamilton Building, has been appointed agent in this city and vicinity for the Solid Steel Company, of Alliance, Ohio, manufacturers of all kinds of steel castings.

Cleveland.

CLEVELAND, September 23, 1889.

Iron Ore.—Dealers could dispose of 400,000 tons of Bessemer Ore at $5.25 if they had that quantity on hand. Inquiries for amounts varying from 5000 to 10,000 tons each are coming in from furnace men in the Mahoning and Shenango valleys and in Pittsburgh. The fact is gradually becoming more apparent, however, that there are but one or two round lots of desirable Ore unsold. Nearly all the companies have little amounts on hand, but these are confined almost exclusively to 500 or 1000 ton lots. A few of the mines are believed to have sold more Ore than they can possibly produce before the close of navigation. The demand for Ore from such mines as the Chapin, Champion, Cleveland, Republic, Ashland, Aurora, Brotherton, Jackson, Florence and Norrie is still good, although scarcely one of the mines named has any Ore to offer. The receipts at all lake ports to date aggregate 5,200,000 tons, against about 3,100,000 tons sent down at a corresponding period last year. The shipments are divided between the four ranges about as follows:

	Tons.
Marquette range	1,800,000
Menominee range	1,250,000
Gogebic range	1,400,000
Vermillion	750,000
Total	5,200,000

The receipts at lower lake ports now average 230,000 tons per week, indicating a total output slightly in excess of 7,000,000 tons. For the scattering lots of Ore still for sale the following prices are asked:

No. 1 Specular and Magnetic Bessemer Ores, Bessemer quality	$5.75 @ $6.25
No. 1 Specular and Magnetic Ores, Non-Bessemer quality	4.50 @ 5.25
Red Hematite Ores, Bessemer quality	@ 5.00
Red Hematite Ores, Non-Bessemer quality	3.75 @ 4.25
Menominee Range Ores, Bessemer quality	4.90 @ 5.20
Menominee Range Ores, Non-Bessemer quality	3.75 @ 4.00
Gogebic Range Ores, Bessemer quality	4.90 @ 5.25

Pig-Iron.—Prices are remarkably firm and the demand is in excess of the capacity of the furnaces. The inquiry for Bessemer Iron is almost universal. Charcoal Irons command $20, while $17, cash, at furnace, has been paid for 1200 tons of No. 1 Foundry. Mill Irons have been bought so eagerly during the past month that there seems to be little to offer in this line, the furnaces being taxed to their utmost limit to fill orders. There is no possibility of the supply overtaking the present consumption of Pig Iron. Selling prices are:

Nos. 1 to 6 Lake Superior Charcoal	$20.00 @ $20.50
No. 1 Strong Foundry, Bessemer quality, ℔ ton	17.50 @ 18.00
No. 1 Strong Foundry, ℔ ton	17.00 @ 17.80
No. 2 Strong Foundry, ℔ ton	16.00 @ 16.80
No. 1 American Scotch, ℔ ton	16.80 @ 17.30
No. 2 American Scotch, ℔ ton	15.80 @ 16.30
No. 1 Soft Silvery, ℔ ton	16.50 @ 17.50
Mahoning and Shenango Valley Neutral Mill Irons, ℔ ton	14.75 @ 15.00
Mahoning and Shenango Valley Red Short Mills, ℔ ton	14.75 @ 15.75

Scrap-Iron.—Old American Rails have advanced to $26, with sale reported at that figure, although one firm bought 200 tons at $25.50. Old Wheels are in fair demand at $18 @ $18.50, and Wrought Scrap is selling freely at $20.

Manufactured Iron.—Common Bar is quoted at 1.65¢ from mills. Sheets are scarce and are bringing fancy prices, and Structural Shapes are also in high favor.

Coke.—The demand is heavy. The price at the ovens is $1.35, with a 15¢ advance announced for October.

Detroit.

WILLIAM F. JARVIS & Co., under date of September 23, 1889, say: Actual transactions during the past week in our local market have fallen below the average of the past six weeks. The market is being watched with no little anxiety by both the "shorts" and the "longs," though the latter seem to be the most contented. A steady and regular hardening in prices generally seems to have become the rule of the market in nearly all grades, possibly excepting some grades of Northern made Foundry Pig. Low grades of Foundry Iron and Gray Forge are higher in proportion than the higher grades of the same brands. The amount of Ore to be brought down from Lake Superior this year will be fully 25 % more than any other year in the history of the trade, while the Ore optimists think nearly 33⅓ % greater output will be shown by the end of the season, which means upward of 7,000,000 tons. Lake Superior Charcoal Iron remains unchanged in price. A reasonably heavy demand continues. The short supply all around now being considered to actually exist will, it is thought, increase the buying and materially raise prices. The market is fairly quotable to-day as follows:

Lake Superior Charcoal, all numbers	$19.25 @ $19.75
Lake Superior Coke, all ore	18.50 @ 19.50
Lake Superior Coke, cinder mixed	17.50 @ 18.50
Standard Ohio Blackband	18.00 @ 18.50
Southern No. 1	17.00 @ 17.50
Southern Gray Forge	15.50 @ 16.00
Southern Silvery	16.50 @ 17.00
Jackson County (Ohio) Silvery	18.00 @ 18.50
Old Wheels	18.00 @ 19.00

New York.

Office of *The Iron Age*, 66 and 68 Duane street,
NEW YORK, September 25, 1889.

Iron Ore.—Some business is being done in Foreign Bessemer grades, on the basis of 9¼¢ ℔ unit for 60 % 0.02 Phosphorus Ore, like Mokta. Bilbao quotes high figures, say 7/9 for Rubios.

American Pig.—The market is quiet and steady, with prices practically unchanged. Consumers who bought liberally some time since are pretty well supplied, and are taking only occasional lots to cover sales. They are not, so far as we can learn, making efforts to contract ahead for any lengthy periods. Sales are on a fairly liberal scale, but our market has shown none of the excitement reported from Western distributing centers. The effect of the rise there is to simply relieve this market from pressure by outside Irons, which now find a better outlet west of the Alleghany Mountains. Quotations are as follows: No. 1 Anthracite Foundry, at tide-water, $17 @ $18; No. 2, $16 @ $17; Gray Forge, $15 @ $15.75; Southern No. 1 Coke Foundry, delivered at New York, $16.75 @ $17; No. 2, $15.75 @ $16; No 3, $15.25 @ $15.75.

Spiegeleisen and Ferromanganese.—While Spiegeleisen has been quiet and nominally is now held at $32, there has been a continued heavy demand relatively for Ferromanganese, which has had a boom of its own, rising very rapidly, with quotations left open only a very short time. We hear that $71 has been paid, and that at the close $75 is being asked by some importers.

Billets and Slabs.—The demand is very active and urgent, but the available supply is very restricted. The mills are

being overrun with inquiries, and there has been business closed to the extent of several thousand tons. As a matter of fact there is almost a famine in Soft Steel, and prices have been again advanced, $30 being quoted by Eastern mills for ordinary 4-inch Wire stock, and little available at that. Nail Slabs are scarce. We note also the appearance of inquiries for Blooms, among them one lot of about 2100 tons. Wire Rods in small lots have sold at $48 at Eastern mill.

Finished Iron and Steel. — Some round lots of Bars have been placed, but reports from the interior of the State indicate that within the week relatively low prices have been accepted. Others, however, ask and have secured better prices. Locally a number of large buildings are in the market. One was placed during the week. Two others, the music hall and the Madison square buildings, are being figured on. In the aggregate these three take about 4000 tons of material. Plates are quiet but firm, while there has been some business in Hoops, with more pending. We quote as follows, on dock: Sheared Plates, 2.15¢; Universal Mill Plates, 2.20¢ @ 2.25¢; Angles, for the smaller sizes, 2.1¢ @ 2.20¢; for larger sizes, 2.25¢; Tees, 2.5¢ @ 2.6¢; Beams and Channels, 2.8¢. In Plates, Steel Tank is 2.3¢ @ 2.35¢ for ¼ inch or thicker and 2.45¢ @ 2.5¢ for thinner; Shell, 2.55¢ @ 2.6¢; Flange, 2.75¢ @ 2.8¢; Marine Steel, 2.8¢ @ 2.85¢; Fire-Box, 3.25¢ @ 4¢. For Bars we quote: Common, 1.65¢; Medium, 1.65¢ @ 1.7¢, and Refined, 1.85¢ @ 2¢. Hoops, 2¢ @ 2.1¢; Galvanized Sheets, 65 % and 5 %; Wire, 75 % and 5 %.

Merchant Steel.—We quote Machinery 2.10¢ @ 2.15¢; Toe-Calk, 2.15¢ @ 2.30¢. Tire, 2.10¢ @ 2.25¢; Sleigh-Shoe, 1.9¢ @ 2¢, delivered, and Spring Steel, 2.4¢ @ 2.5¢, delivered.

Steel Rails.—The market is decidedly firmer, and there is not a single seller who is not quoting $29 at Eastern mill, although there is a feeling of uncertainty still whether those who have been selling close to $28 lately will actually hold out for that figure on work for desirable deliveries. For business of any magnitude $29 has not yet been actually obtained in this market. Still the feeling is buoyant, and the conviction is freely expressed that before long $30 and upward will rule. Pig-Iron is higher. Spiegeleisen has risen from $26 in the summer to $31.50 @ $32 now, and there is no early prospect of a lowering in raw material, if indeed a further advance does not come. There is a good deal of work on the market and the prospect a demand greater than for this year. A number of the Steel-works, too, are independent of the Rail market, the enormous demand for Billets at relatively much better prices causing them to turn to that business. Among the recent sales reported by Eastern mills we note about 15,000 to 18,000 tons, the largest single lot being 10,000 tons for Southern delivery. In the West 40,000 tons of Rails have been purchased for the Union Pacific at $32, Chicago, although in some quarters it is denied that the sale has been consummated. The Chicago market is now quoted $33, while Pittsburgh is asking and for small lots getting $31. It remains to be seen whether for January and February delivery some orders will be taken by some of the mills as a starter on their order-books at a concession from the rates quoted. While it may be possible, the tone of the market now and the general situation in the Iron trade seem to point in the direction of higher rather than lower prices. Well-informed and conservative producers express the belief that the real question at issue is not so much whether prices will advance as it is whether they will rise much or little. That, of course, will depend upon the amount of business which will come up. Some express the fear that values may go up too high and cause excitement. In the West the advance from the lowest point, a shade under $26, is equivalent to fully $5 a ton. In the East, starting from the same level, it is $3 ₹ ton.

Rail-Fastenings.—Outside of the placing of a 5000-keg order in the West there has been no heavy business of any consequence. The manufacturers are firmer, however, and are now asking $2 @ $2.05 for Spikes and 1.9¢ @ 1.95¢ for Angles.

Old Rails.—There have been sales aggregating about 3000 tons, among them one lot of 1000 tons from a New England road at private terms. It is reported that $23.50 has been accepted in some instances, but $24 @ $24.50 is now considered a close quotation.

Scrap.—The market is steady at $21 @ $22 for No. 1.

Financial.

During the week under review the movement in speculation on the Stock Exchange has been irregular and moderate in volume. The rate situation in the Northwest has been unsatisfactory, in spite of all the efforts made to create the impression that its importance was being unduly magnified. The result has been a distinct halt in speculation and a decided narrowing of the market, to which has been added renewed fears of a tightness in the money market. On Tuesday the rate was temporarily brought up as high as 7 %, but within an hour dropped back again to 3 %. The fact, however, remains that the great body of holders of stock evince considerable faith in the general prosperity of the country, and are not now easy sellers, so that a decline of a few points does not bring out any considerable quantity of long stocks. The *Financial Chronicle* gives the operations of 105 roads for July, showing that during the current year their estimated net earnings have been $17,757,991, as compared with $14,479,302 during the same period in 1888, thus showing an increase of $3,278,609. The gross earnings of 97 roads from January 1 to July 31 were $295,163,585, an increase of $14,757,062; net, $92,516,711, an increase of $10,747,784. The gross earnings of 85 roads for the first week of September were $6,084,366, an increase of $445,798, and those of 47 roads for the second week of September, $4,192,015, an increase of $439,903.

One or two important movements have taken place in some of the great railroads of the country. Mr. Villard has consented to accept the modifications in his scheme proposed by certain directors of the Northern Pacific Railroad. From the West come reports that a new traffic arrangement has been made between the Union Pacific and the Manitoba roads, the latter making low rates from Sioux City to Duluth, so that the Union Pacific will be enabled to handle Pacific Coast traffic both at Chicago and Duluth. The Louisville and Nashville Railroad will withdraw its third mortgage issue, of which nearly $10,000,000 are outstanding, and issue in its stead $13,000,000 of common stock. Henry Clews has expressed the following view on this movement: "Recent experience has demonstrated that when a clique holds the controlling interest in a stock it is only necessary to get the company to pass a resolution to increase the capital stock—the larger the amount the better—ostensibly to take up something else which said company have out and 'for payment of commissions and other purposes' and the stock is then at once kited upward. The only explanation I can give of this new inflation is that formerly when stocks were watered it was plain Croton that was infused; now through a new process Croton water is distilled, consequently the water now used is called 'Hygeia.' When a person wants the best quality of anything he must pay for it. Hygeia, as an elixir when administered without stint into stocks, is evidently a great success."

Trust stocks, particularly Sugar Trusts, have had a sharp decline, falling considerable under par. On the other hand, the advance in Tennessee Coal and Iron, begun since the accession of Thomas C. Platt to the presidency of that company, has continued, the rise within two weeks amounting to a dozen points.

The weekly bank statement of averages reports a loss of $4,190,400, the loss of the surplus reserve being $3,155,375, leaving it at $1,979,400, against $11,493,725 on the 22d of September, 1888. The action of Secretary Windom, who has decided to make purchases of silver in the future by accepting the lowest offer, instead of making counter offers, has been accepted by the silver men as an evidence of a friendly spirit, which will bring about larger trade in the future. It is believed that strong pressure will be brought to bear upon the new Congress to increase the silver coinage, even if the increase goes no further than the $4,000,000 monthly now authorized by law.

There was a decided increase in the outward movement of produce and merchandise from the port of New York during the week, the total reaching a money value of $7,322,233, against $6,177,320, the amount given in the previous Custom House return. The enlarged shipments to Liverpool of various articles, together with some heavy consignments of tobacco, petroleum and lard, helped to swell the gross clearances. Liverpool figured in the manifest for $839,797 seal skins, $593,098 cotton, $191,400 fresh meat, $155,248 bacon.

The New York *Mail and Express* prints the following: "There was considerable anxiety over the course of Cameron Coal, from which all support seems to have been suddenly withdrawn, and the stock sold down to the lowest point that it has struck in a very long time. The company have been embarrassed in a measure for ready money, although their furnace is earning a big profit every day, but a large amount of iron has been sold for future delivery and the company feel the want of sufficient working capital."

The local money market has been active and firm, and there has been a further stiffening up. Foreign exchange has ruled quiet and steady. Bar silver is unchanged. Call loans at the Stock Exchange and bankers' balances have been available at 5 @ 7 %, the bulk of the business transacted having been at 5½ %. Time loans have been accessible at 5 @ 5½ %. Commercial paper has been in limited request, local banks doing nothing beyond the accommodation of their regular customers. First-class bills with 60 or 90 days to run have been taken at 5 @ 5½ % discount, four months at 5¾ @ 6¼ and good single-named paper at 6¼ @ 7¼.

The closing quotations of bonds show the following:

	Bid.	Asked.
4½s, 1891, registered	105⅝	106⅛
4½s, 1891, coupon	105⅝	106⅛
4s, 1907, registered	126⅝	127⅛
4s, 1907, coupon	127⅛	128⅛

Metal Market.

Copper.—Since our last week's report spot Copper improved from £43. 2/6 to £43. 5/ in the London market, futures remaining unaltered, £42; sales aggregating 400 tons. Our own market has remained inanimate, featureless and nominal at 11¢ Lake, 10½¢ Electrolytic, and 10¢ casting brands.

Tin.—There has been a slight improvement for the week in London, where spot Tin advanced from £90. 7/6 to £90. 10/ last night, and futures from £90. 15/ to £91, sales running up 400 tons. Here Tin was unsettled, with sales of prompt shipment from Liverpool at 20.20¢, spot at 21.25¢@21.40¢; October, 20.20¢@20.25¢; November, 20.15¢ and December 20.20¢ down to 20.15¢, 110 tons being sold altogether, while 425 tons arrived. Spot closes this forenoon at 21⅜¢ @ 21½¢, and September at 20¾¢ @ 20⅞¢. The Banca sale in Holland to-day averaged 55.37½ guilders the 50 kg., which equals £93. 17/6 in Holland. *Tin-Plates.*—There has been a slightly improved demand for Tin-Plates, so that stocks do not for the present accumulate on dealers' hands. The demand for future delivery is still rather slack, and, although the English market is reported in some quarters very firm—with talks of strikes among the Steel-Bar workers—there are enough sellers continually cropping up to supply the current demand at lower than ruling prices. We quote large lines, ordinary brands, ℔ box: Siemens-Martin Steel, Charcoal finish, $4.75 @ $5.50; Coke finish, $4.60 @ $4.70; Ternes, $4.12 @ $4.30; Coke Tins, $4.30 @ $4.40, and Wasters $4.15.

Lead—Has been livelier, sales reaching 800 tons in the open market for the week at 3.90¢, which is also the closing quotation. In the absence of news from the Government, the tendency for the time being is downward.

Spelter.—Hardly anything has transpired during the week, except in a jobbing way, at 5.10¢ @ 5.15¢. There is no Silesian, and none afloat that we know of. The demand is light, and the nominal quotation is 6½¢.

Antimony. — Continental purchasing absorbs the little England has to spare of Cookson's, which is now worth 19¢ @ 19½¢ in this market. Hallett is wanted on all hands likewise; it sells at present at 17½¢ @ 17½¢ in this city.

New York Metal Exchange.

The following sales are reported:

THURSDAY, September 19.

15 tons Tin, September..... ..... 21.30¢
(Via City of Paris.)
10 tons Tin, October.....20.25¢
10 tons Tin, November. ....20.25¢
50 tons Tin, November..... .....20.20¢

FRIDAY, September 20.

10 tons Tin, prompt Liverpool shipment.20.20¢
10 tons Tin, spot..... ... . 21.25¢
50 tons Tin, November.....20.15¢

SATURDAY, September 21.

20 tons Tin, October.....20.20¢
16 tons Lead, October..... 3.95¢

MONDAY, September 23.

10 tons Tin, October.....20.25¢

TUESDAY, September 24.

10 tons Tin, October.....20.25¢

WEDNESDAY, September 25.

40 tons Tin, December.....20.20¢
30 tons Tin, October.... .....20.30¢
30 tons Tin, November ....20.20¢

Coal Market.

A slightly better feeling prevails in the Anthracite Coal trade; still, the supply is in excess of the current demand and prices remain at the same level, with occasional reports of cutting. We quote Stove Coal $4 @ $4.10, alongside, with reports of sales for the Boston market as low as $3 90; Lehigh Broken, $3.90 @ $4, and Egg and Chestnut $3.90 @ $4, alongside. The Bituminous trade remains unchanged at $3.50, alongside, New York.

The Cambria Iron Company, who were so severely injured by the Johnstown floods, have declared their semi-annual cash dividend of 5 per cent.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, September 25, 1889.

The market for Pig-Iron has continued active and strong, Scotch particularly so. Special brands are scarce and prices for the same are still advancing. There is more or less pressure for deliveries from various quarters, makers being in arrears. This circumstance has led to large quantities being withdrawn from stores, chiefly for home consumption. All makers' Iron is relatively much above the current prices for Connal's warrants. The American inquiries have been more numerous. Speculation has continued active. Most brands of Scotch are 6d higher than last week. Middlesborough has brought 6d @ 9d advance and Hematites are very strong. Business in Manufactured Iron has continued brisk at firm prices and in Steel of all descriptions there is still a good business. Rails are quoted 2/6 up, but former quotations for Billets, Slabs and Crop Ends are repeated.

Block Tin has hardened somewhat in price during the week, owing to favorable position of supplies here, which induced good buying. The upward turn of prices was arrested, however, by heavy selling, but the offering has been well absorbed. A large number of small accounts are open awaiting an advance, but the "bear" interest, while represented by a small minority numerically, is made up of powerful operators. In this fact lies the only visible danger to prices being maintained. To-day's business was at firm prices.

Copper has cheapened somewhat in the face of scarcity of cash warrants and an improved demand for forwards. The sale is reported of 800 tons Montana Matte at 8/, but the demand for furnace material generally has continued hesitant and smelters are buying Chili Bars instead, being unwilling to pay the prices asked for Matte and Precipitate. It is stated that the Paris Copper interest is not harmonious and rumors prevail that sales have been made, *sub rosâ*, below the agreed prices. The stability of prices seems still to depend upon the patience of the holders of French reserve stock. It is believed that it has been from this stock that some of the alleged underselling was done.

The Tin-Plate market has continued very firm and makers' quotations are stronger. There are a great many inquiries for forward deliveries, but comparatively little business has been put through, buyers and sellers being far apart. Buyers have to pay ruling rates for specials when required for early delivery. The Llwydarth mill will shortly restart.

Old Iron Rails are attracting increased attention, and there are more buyers than sellers at the present time. There is a wide difference of ideas on prices.

The average selling price for Staffordshire Finished Iron during July and August was £6. 8/9, an advance of 5/6 over that for May and June.

Cleveland Pig. — Under continued active demand prices have advanced 9d, and the market is strong. No. 3 Middlesborough quoted 44/9, prompt.

Scotch Pig.—Prices generally about 6d higher and the market active at the advance.

No. 1 Coltness,	f.o.b. Glasgow	.....	65/6
No. 1 Summerlee,	" "	....	64/6
No. 1 Gartsherrie,	" "	.....	62/6
No. 1 Langloan,	" "	.....	64/6
No. 1 Carnbroe,	" "	....	54/
No. 1 Shotts,	" at Leith	.....	63/6
No. 1 Glengarnock,	" Ardrossan	.. ..	60/6
No. 1 Dalmellington,	" "	. .....	51/6
No. 1 Eglinton,	" "	....	50/6

Steamer freights, Glasgow to New York, 4/: Liverpool to New York, 10/.

Bessemer Pig.—The demand continues active and prices strong. West Coast brands, mixed numbers, 66/6, f.o.b. shipping point.

Spiegeleisen.—A fairly active demand and prices firm. English 20 % quoted 82/6, f.o.b. at N. W. England shipping point.

Steel Rails.—Demand continues large. Makers sold far ahead, and asking 2/6 advance. Heavy sections quoted at £5. 7/6 and light sections £5. 12/6 @ £6. 5/, f.o.b. at N. W. England shipping point.

Steel Blooms. — There is a fairly active business at firm prices. We quote £4. 10/ @ £4. 12/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Business not so active, but prices very firm. Bessemer, 2½ x 2½ inch, £4. 17/6 @ £5, f.o.b. at N. W. England shipping point.

Steel Slabs.—A quiet market for these, but sellers firm. Bessemer, £4. 10/ @ £4. 12/6, f.o.b. at N. W. England shipping point.

Old Rails.—Demand fairly active, but buyers and sellers apart. Tees quoted at £3. 2/6 and Double Heads £3. 7/6, f.o.b.

Scrap-Iron.—A moderate business at firm prices. Heavy Wrought quoted £2. 12/6, f.o.b.

Crop Ends.—Prices firm, but the demand moderate. Bessemer quoted £2. 15 @ £2. 17/6, f.o.b.

Tin-Plate. — A somewhat increased business at firm prices. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	15/3 @ 15/6
IC Bessemer Steel, Coke finish	13/6 @ 13/9
IC Siemens " " "	13/9 @ 14/
IC Coke, B. V. grade	13/3 @ 13/6
Charcoal Terne, Dean grade	12/ @ 12/3

Manufactured Iron.—Business good and prices firm all through. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars	8	10	0	@	8	15	0
" Common "	7	0	0	@	7	5	0
Staff. Bl'k Sheet, singles	8	15	0	@	8	17	6
Welsh Bars (f.o.b. Wales)	6	12	6	@	6	17	6

Copper.—Rather more business and very little movement of prices. Chili Bars quoted at £43. 5/, spot, and £42, three months' futures. Best Selected, £48.

Tin.—The demand very fair and prices quite steady Straits quoted at £90. 12/6, spot, and £91 for three month's futures.

Spelter.—More supply offering; prices rather easier. Quoted at £21. 15/ for ordinary Silesian.

Lead.—A moderate business doing and prices barely steady. Quoted £12. 10/ for Soft Spanish.

It is stated that the Massachusetts and Southern Construction Company, who are building the Charleston, Cincinnati and Chicago Railroad, have completed the sale of $6,000,000 first mortgage bonds to a New York and Philadelphia syndicate, to be paid for as fast as the road is completed.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds
Kilogram	2.205
Picul	134.

BELGIUM.

BRUSSELS, September 14, 1889.—*Iron.*—If we except Beams the market for finished Iron has gone on swimmingly. In Beams the English are becoming competitors. The London strikes have, however, brought us a good many fresh orders, but as they were all for prompt delivery some could not be filled, our works having booked orders enough to last them many months to come. The promising position of the Iron markets causes some works to increase their capacity, among others Mr. Bondhill's, of Marchienne, for the production of Merchant Iron. The Couillet Siemens-Martin Steel Works will commence operations on October 1. Following is the Iron and Steel movement in Belgium the first seven months:

	Importations.		Exportations.	
	1889. Tons.	1888. Tons.	1889. Tons.	1888. Tons.
Iron Ore	1,087,100	989,586	93,965	83,460
Steel Ingots	1,479	588	2,481	2,851
Steel Rails	251	168	26,843	32,462
Other Steel	1,639	1,440	11,516	14,935
Wro'ght-Steel	684	249	2,793	1,651
Pig-Iron	124,271	119,533	4,070	6,103
Scrap-Iron	13,403	16,958	3,162	447
Iron Wire	1,968	2,031	2,720	2,489
Iron Rails	412	129	5,132	6,701
Sheet-Iron	949	723	31,228	24,147
Other Iron	7,672	4,437	139,843	127,353
Nails	310	206	7,382	7,022
Wrought-Iron	2,274	2,389	18,867	13,530
Castings	1,258	473	11,385	8,853
Totals	1,243,650	1,139,000	371,396	332,584

—Moniteur des Intérêts Matériels.

SPAIN

BILBAO, September 7, 1889.—*Iron Ore.*—An active demand for Ore has been kept up during the week, leading to important transactions. As much as 9/ was paid for Campanil for delivery next year, and 8/7 @ 8/9 on the spot. Rubios have commanded 7/4 @ 7/9, and in a couple of weeks they are likely to be worth 8/. Stocks of the latter are quite reduced, nor is it as easy to extract the Ore nowadays as was formerly the case, when there was plenty of it within reach. Freights fluctuate but little. Ore shipments to date amount to 2,694,124 tons, as compared with 2,638,564 same time last year and 3,140,234 in 1887. During the week under review 72,489 tons were exported. *Pig-Iron.*—There were shipped to Civita Veechia, in Italy, 1820 tons, while 895 went coastwise. Exportations of Ore and Metals from Spain during the first seven months were as follows:

	1887. Tons.	1888. Tons.	1889. Tons.
Calamine	19,849	19,770	15,925
Pyrites	470,230	494,348	529,498
Iron Ore	3,159,987	2,743,582	3,043,124
Pig-Iron	72,774	41,640	43,263
Precipitate	16,409	15,745	16,819
Quicksilver	1,105	865	1,883
Pig-Lead	77,037	73,092	74,880
Totals	3,817,391	3,389,042	3,725,392

There is an increase in every item except Calamine.—*Bilbao Maritimo y Comercial.*

EAST INDIES.

COLOMBO, CEYLON, August 8, 1889.—*Plumbago*—Continues very scarce. We quote, in rupees, ₹ ton: Large lumps, 145 @ 170; ordinary ditto, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Since October 1 shipments have been distributed as follows: To England, 130,049 cwt.; to Venice, 102; to Hamburg, 7816; to Antwerp, 12,642; to Bremen, 1254; to Holland, 457; to India, 139; to Australia, 392, and to the United States, 126,435 cwt.; together, 279,266 cwt., against 215,440 in 1888, 215,614 in 1887, and 173,884 in 1886. *Ebony*—Has been selling at 100 @ 200 rupees ₹ ton, as to quality. *Exchange.*—Six months' sight on London, 1/4 19-32 ₹ rupee.—*Volkart Bros., Ceylon and Malabar Coast, through their agent in New York, Mr. John W. Greene, 82 Wall street*

MANILA, September 16, 1889.—*Hemp.*—There are buyers at $14.12½ ₹ picul, against $9.87½ same date last year, equaling ₹ ton, cost and freight, £44. 12/6, against £32. 7/6. Clearances for the United States since January 1 sum up 152,000 tons, against 125,000 in 1888; there remain loading for ditto 10,000 bales, against 50,000; cleared for England since January 1, 229,000 bales, against 246,000; cleared for all other ports, 35,000, against 53,000; receipts at all ports since last cable, 5000, against 12,000, and since January 1, 415,000 bales, against 439,000 in 1888 and 354,000 in 1887. *Freight.*—85, against 86. *Exchange.*—Six months' sight on London, 3/5¾, against 3/5.—*Ker & Co., per cable direct to their agent in New York, Mr. Charles Nordhaus, 89 Water street.*

HOLLAND.

ROTTERDAM, September 2, 1889.—*Tin.*—Following are the monthly statistics from Holland for August:

	July 31, 1889. Slabs.	Aug. 31, 1889. Slabs.	Aug. 31, 1888. Slabs.
Banca stock on warrants	34,828	28,078	20,108
Billiton stock in Holland	35,410	30,160	13,468
Total stock	70,238	58,238	33,576
Banca, July and August deliveries	11,847	16,197	11,746
Billiton, July and August deliveries	7,615	9,400	8,375
Total deliveries	19,462	25,597	20,121
Banca deliveries since January 1	88,789	104,986	92,592
Billiton deliveries since January 1	49,003	58,403	59,186
Banca afloat	6,400	.....	4,000
Banca stock, awaiting coming auctions	149,209	147,644	126,928
Billiton afloat	34,120	46,570	46,000
Price of Banca, fl	54½	55¼	58¾
Price of Billiton, fl	53¾	55	57½

About 13,000 piculs Billiton offered in public sale at Batavia on the 27th of August fetched the average price of 61.40 francs ₹ picul, costing to sell here about 54¾ francs by steamer. The next sale will be held on the 23d of October.

Export of Tin from Holland.

	Six months.		
	1889. Tons.	1888. Tons.	1887. Tons.
To Germany	3,124	3,268	2,734
To England	95	59	85
To Belgium	486	415	544
To France	137	224	195
To Hamburg	283	218	307
To the United States	226	187	264
To other countries	198	337	411
Totals	4,549	4,708	4,540

—De Monchy & Havelaar.

Clock-Making in the Black Forest.

The British Consul at Mannheim, in a report which has just been issued by the Foreign Office, says that clock-making in the Black Forest has of late been very active, particularly in regard to clocks on the American pattern for export. The old-fashioned Black Forest clock in a wooden case is slowly disappearing from the market. The prices for those in the American style are, however, low, and they have consequently in many cases deteriorated in quality. In the interest of the trade some firms of repute continue to demand higher rates, but their efforts to maintain a high standard of workmanship are defeated by those who injure the trade by underselling and by inferior qualities. The demand has increased considerably, and with an improvement in quality better prices could easily be obtained. At present what profits are made find their way chiefly into the pockets of dealers and agents. "England continues to buy superior and fine qualities, English customers being extremely conservative in taste, and demanding a particular style of make and ornament, together with first-class workmanship; and these being requirements such as only firms with long experience can satisfy, a new man hardly ever succeeds in introducing his products into the English market."

Chrome-Iron Ore Linings in Open-Hearth Furnaces.

Adelstjerna* states that in the summer of 1887 the first experiments with Norwegian chrome-iron ores were started at the Trollhatta Open-Hearth Steel Works. The ore was in the form of lumps of, at the maximum, ¼ cubic foot in size, mixed with much small ore and dust. The small quantity of large lumps was used in building up the walls, and small ore and dust being used for the hearth. A mixture of lime with twice its volume of finely-divided ore was used as mortar. The tap-hole was made of chrome ore and tar stamped down. The furnace was very carefully heated up on starting.

The reaction at the boiling stage was very violent, and although a much larger proportion of pig-iron was used than was customary the charge was ready very much sooner than was usual. So violent, indeed, was the boil that it was not deemed prudent to tap the charge until the metal had become very soft, and even then the metal was scattered in all directions. In the pan, too, although it was capable of holding three times the quantity of metal, the boil still continued to such a degree that the metal boiled over the sides, and the same thing happened in filling the molds. By careful pouring, however, sound ingots were produced.

The experiments were stopped at the end of a week, because the desire at the Trollhatta Works is to produce tool-steel, and when chrome-ore linings were employed, although 60 to 80 per cent. of pig-iron was added, only the soft and, for them, useless varieties of metal could be made.

The lining at the end of the experiments was found to have stood extremely well, and had not been in the least degree attacked either by the metal or the slag. A lump of ore broke away, however, from the hearth from time to time, and rising through the metal swam on the surface. Still, the cavities in the earth caused in this way were very easily repaired. The mixture of tar and ore around the tap-hole did not stand so well. It cracked and broke in pieces. It was replaced by a mixture of 2 parts by volume of chrome ore and 1 part of lime containing 0.25 per cent. of silica. This mixture hardened and stood very well.

The next experiment with chrome iron ores were made at the Kolsva Works. The boil was not nearly so strong as in the experiments at Trollhatta—in fact, the boil was not markedly greater than when acid-lining was used The chrome ore bed softened but remained intact. This softening was thought to be due to the presence of serpentine in the ore.

In conclusion, the author observes that no better material can be found for the walls of an open-hearth furnace than chrome-iron ore, as it is neither attacked by the slag nor does it fuse away. If, however, it is desired to make the bed of the furnace of chrome-iron ore, a suitable method will in the first place have to be found out. In Finland, as well as at the Russian open-hearth steel-works, chrome-iron ore beds are no longer employed, as it was found that the larger ore lumps broke away from the material of which the bed was composed and rose through the molten metal, thus causing the bed to wear away rapidly. This breaking away of the larger ore lumps does not take place at once, but only after the furnace has been some time at work. A softening of the hearth has in no case been observed at these Russian and Finnish works.

* Jernkontorets Annaler, vol. xliii, No. 7.

Hardware.

Reports from manufacturers indicate that they are generally busy and in many cases quite full of orders and unable to furnish goods as promptly as desired. Business in the leading Hardware centers, especially in the West, is referred to as very gratifying in volume, and it is evident that a good and steady business is doing. Merchants are ordering goods carefully and are not showing a disposition to purchase in excess of their near requirements, although in certain lines, which have been recognized as very low and which lie near the raw material, there have of late been many heavy orders placed. This fact, together with the condition of the Iron market, has something to do with the numerous advances in heavy goods which have recently been announced. The trade appear to have more confidence than heretofore that prices wil not continue to recede as they have on so many lines during the past few years, the impression prevailing more generally that, on staple goods at least, the bottom has probably been touched. While there is thus increased confidence there is little disposition to purchase liberally, and orders are for the most part limited to assorted lots, comparatively small, to meet the immediate wants of the trade. This will be recognized as an eminently healthy condition of things, and with excellent crops, firmness in price of raw material and a sound financial condition the prospect is certainly encouraging.

Wire Nails.

The improvement in the Wire Nail market referred to in our last issue continues, and prices have materially strengthened. The extreme quotations which have been out have been withdrawn, and manufacturers are with scarcely an exception announcing material advances. It is also intimated that if the raw material continues to advance, as now seems not improbable, it will be found necessary to make a still further advance in the Nails before long. The Cincinnati Wire Company, the HP Nail Company and other manufacturers advise us that they are at the present time quoting $2.50 base, a rebate of 10 cents per keg being made for carload lots. There is not, however, as yet entire uniformity in naming these prices, but the market is unquestionably higher and in much improved condition. Many of the jobbers who hold Nails purchased at low figures are selling them at prices somewhat less than those named above.

Cut Nails.

Under fairly liberal purchases the Cut-Nail market in New York has at last advanced, so that to-day $1.90 is the usual quotation for carload lots of Cut Nails on dock, with $1.85 named under exceptional circumstances for particularly desirable assortments. The advance in the West has relieved the Eastern market completely from competition from that quarter, and has lessened the offerings in markets fairly tributary to both, notably in the Southern States.

The situation in the West, so far as raw material is concerned, is even more striking than it is in the East. Steel dropped lower there and has since advanced even more. As late as June Steel Billets sold as low as $25.50 in large quantities. To-day $31 is an inside price, and it is doubtful whether any large contracts could be made at that figure. This represents an advance of $5.50 in the price of the steel, which is equivalent to about 30 cents per keg of Cut Nails. Now, it is true that Nails sold in Wheeling at one time as low as $1.57 net, but this was done only to a limited extent, and involved a heavy loss to the makers. It will be observed, therefore, that with present prices of raw material $2 net, f.o.b. Wheeling, really represents merely the advance in the raw material. From all sections of the country come reports of a scarcity of steel approaching a famine, and yet prices in this country are $3 to $5 below the figures at which foreign stock could be laid down here. There is no apparent prospect of any material decline, while the probabilities point to a further advance in the raw material.

Wrought-Iron Pipe.

At a meeting of the Wrought-Iron Pipe manufacturers, held September 18, a new price-list was adopted covering Black, Galvanized, X, XX Heavy and Tarred Pipe. These lists are printed below, and from them it will be seen that a general advance averaging from 7½ to 10 per cent. has been made in the list prices, the advance being somewhat heavier on the small than on the large sizes. The list of Boiler-Tubes remains unchanged. The manufacturers generally report a large business, and many of them are far behind their orders. The market is characterized by a decidedly firm tone, and it is thought not unlikely that a further advance will be made before long. The discounts recently ruling are still adhered to, except in the case of Boiler-Tubes, in which an advance is to be noted. The discounts on Pipes and Boiler-Tubes are as follows:

1¼-inch and smaller Black Pipe ..... 50 %
1½ " larger " " ..... 62½ %
1¼ " smaller Galvanized Pipe ..... 42½ %
1½ " larger " " ..... 50 %
1¼ " smaller Tarred Pipe ..... 50 %
1½ " larger " " ..... 62½ %
Well Casing, all sizes ..... 55 %
Lap-Welded Charcoal Iron Boiler-Tubes, 1¾-inch and smaller diameter ..... 50 %
Lap-Welded Charcoal Iron Boiler-Tubes, 2 inches and larger diameter ..... 55 %
Lap-Welded Steel Boiler-Tubes ..... 50 %

REVISED PRICE-LIST.

Plain Wrought-Iron Lap-Welded Steam, Gas and Water Pipe.

Inside diameter, nominal.	Price per foot, plain.	Outside diameter, actual.	Weight per foot, nominal.
Inches.		Inches.	Pounds.
1⅛	$0.23	1.9	2.68
2	0.30	2.37	3.61
2½	0.47	2.87	5.74
3	0.62	3.5	7.54
3½	0.74	4.00	9.00
4	0.88	4.5	10.66
4½	1.06	5.00	12.34
5	1.28	5.56	14.50
6	1.65	6.62	18.76
7	2.10	7.62	23.27
8	2.75	8.62	28.18
9	3.75	9.68	33.70
10	4.75	10.75	40.06
11	6 00	11.75	45.02
12	7.00	12.75	49.00
13	8 00	14.00	54.00
14	9.50	15.00	58.00
15	11.00	15.00	.....

Galvanized Wrought-Iron Lap-Welded Steam, Gas and Water Pipe.

Inside diameter, nominal.	Price per foot, galvanized.	Outside diameter, actual.	Weight per foot, nominal.
Inches.		Inches.	Pounds.
1⅛	$0.26	1.9	2.68
2	0.34	1.37	3.61
2½	0.53	2.87	5.74
3	0.68	3.5	7.54
3½	0.83	4.00	9.00
4	1.03	4.5	10.66
4½	1.31	5.00	12 34
5	1.60	5.56	14.05
6	2 00	6.62	18.76
7	....	7.62	23.27
8	....	8.62	28.18
9	....	9.68	33.07
10	....	10.75	40.06
11	....	11.75	45 02
12	....	12.75	49.00
13	....	14.00	54.00
14	....	15.00	58.00
15	....	16.00	.....

Plain Wrought-Iron Butt-Welded Steam, Gas and Water Pipe.

Inside diameter, nominal.	Price per foot, plain.	Outside diameter, actual.	Weight per foot, nominal.
Inches.		Inches.	Pounds.
⅛	$0.04	0.4	0.24
¼	0.04	0.54	0.42
⅜	0.04½	0.67	0.56
½	0.05½	0.84	0.84
¾	0.07½	1.05	1.12
1	0.10½	1.31	1.67
1¼	0.14	1.66	2.24

Galvanized Wrought-Iron Butt-Welded Steam, Gas and Water Pipe.

Inside diameter, nominal.	Price per foot, galvanized	Outside diameter, actual.	Weight per foot, nominal.
Inches.		Inches.	Pounds.
⅛	$0.05	0.4	0.24
¼	0.05	0.54	0.42
⅜	0.05½	0.67	0.56
½	0.07½	0.84	0.84
¾	0 09½	1.05	1.12
1	0.13½	1.31	1.67
1¼	0.18½	1.66	2.24

For Selected Pipe or Pipe cut to specified lengths the discount will be 5 per cent. less in the gross (*i. e.*, 5 per cent. higher in gross list discount) than on Regular Pipe.

On Pipe lighter than standards, or without threads or sockets, no extra allowance will be made.

Miscellaneous Prices.

Manufacturers of Machine Bolts have quite generally made an advance in prices ranging from 7½ to 10 per cent., although there is not entire uniformity in the quotations which they make, there being especially some irregularity in the difference between the larger and the smaller sizes.

The market for Nuts and Washers is decidedly firm and these lines have been advanced from ¼ to ⅜ cent per pound.

There is evidence of something of a recovery in Strap and T Hinges and Wrought Butts, and most of the manufacturers have withdrawn their extreme quotations. The market is therefore perceptibly stronger. A larger number of orders have recently been booked, and the fact that the manufacturers are well supplied for some time to come, in connection with the rise in the price of the raw material, has been influential in bringing about this improved condition.

There has recently been a heavy demand for Ammunition in nearly all lines and the trade still continues active. As a result there is some difficulty in having orders promptly filled. In Loaded Shells there is especial difficulty in obtaining the goods promptly, several weeks being often required before orders can be filled.

The Terry Mfg. Company, Horseheads, N. Y., are putting on the market a line of Stebbins' Pattern Molasses Gates, which are offered at somewhat lower figures than those at which the goods have heretofore been sold.

The manufacturers of Iron-Pipe Fittings are very generally withdrawing their quotations, and an advance of about 5 per cent. is being made. The trade in this line is active and prices are regarded as firm.

As noted in our last issue, the market for Sisal and Manila Rope has recovered tone, and an advance of about ¼ cent per pound is to be noted. There is not entire agreement in the quotations made in the different markets, Boston and Philadelphia having advanced their prices slightly more than New York.

E. H. Wayne, 422 Commerce street, Philadelphia, Pa., in addition to the Scale-Beam to which we referred in our last issue, is making a line of Plastering Trowels, 10 and 11 inch, which are sold at $3 and $3.50 per dozen.

The Centennial Door-Bell, which is put on the market by Tommins & Adams, 116 Chambers street, New York, a description of which is given among the novelties on page 501, is sold at $18 per dozen, subject to a discount of 35 per cent. and 2½ per cent. cash.

The Fred J. Meyers Mfg. Company, Covington, Ky., advise us that their price on Hunter's Sifters is $2 per dozen. The demand for this well-known article is referred to as very satisfactory.

Freight Classification.

The attention which is being given to freight classification discovers a number of inequalities in regard to Hardware and related lines which should probably in the interest of all concerned be corrected. The recent action by which in the Trunk Line classification Hardware was put in third class was a step in the right direction, and removed objections on the part of many manufacturers and merchants. There are, however, a number of articles and lines which with equal justice should be given a lower grading, many of these being entitled to third class, or even fourth, which still remain second, or, in some extreme instances, first class.

It will, for example, be observed that the grading of Clothes-Wringers remains as it was under the former classification, these goods in less than carload lots being second class. Against putting them fourth class in carload lots no objection can reasonably be taken, but a little consideration will make it obvious that second class is too high for Wringers in less than carload shipments. The goods are well packed in boxes of a convenient size for handling, both as to bulk and weight More than half of the Wringers shipped, perhaps about three-fifths of the entire output, are wood-frame Wringers represented by the Universal, Novelty, Keystone, Peerless, No. 10 Princess, &c., which are usually packed half-dozen in case, the outside measurement being about 15 x 18 x 24 inches, and the gross weight 105 to 110 pounds. Perhaps a third of output is represented by Wringers of the Eureka style, which are also packed half a dozen in a case, the outside measurement of case being about 8 x 19 x 22 inches, and the gross weight per half dozen from 80 to 85 pounds. In addition there are some styles of Wringers using steel springs and of varying construction, which are in some cases more bulky, but also of greater weight, so that the two styles referred to above fairly represent the whole line, except Bench-Wringers, which are exceptionally bulky, but are at the same time an insignificant proportion of the business, and so may be left out of the account. It will thus be seen that the goods are compact and fairly heavy in proportion to their bulk, thus entitling them to a rather low classification. They certainly in weight compare well with some lines of Hardware which are now shipped as third class, and it is difficult to see any reason why they should be under these circumstances continued in second class. They are also goods that are not at all of a perishable nature and not liable to injury in transit, so that there is scarcely ever a claim for loss or damage. The low price at which the goods are sold furnishes also another argument for the lowering of the classification, there having been in this line probably a larger reduction in price within a few years than in most goods handled by the trade. Many articles in Hardware which are certainly more valuable than Wringers, and at the same time more easily damaged and more liable to shortages, are given third class, while these goods are still held in second. Relating to this matter and giving reasons for a more advantageous classification, we have the following from an Eastern manufacturer:

We have always felt that the freight classification on Clothes-Wringers in less than carload lots was unreasonably high. The Wringers made by us are packed in cases containing half a dozen each, weight about 100 pounds, and each case occupies about 3 cubic feet. The value is but a fraction of that of many articles on the list carried at much lower relative expense. We presume that in making up their classifications the officials are guided by the relations of weight, bulk, value of articles, risk of breakage, damage, &c. While, of course, it is impracticable to allow temporary fluctuations in market values to enter into these calculations, we believe that the fact of Clothes-Wringers having dropped 50 to 75 per cent. in values since this classification was originally made should have some considerable influence; and, further, this competition in distant markets has brought about these low prices. Now, a fair reduction of rates would insure the Eastern manufacturers a greatly-increased trade, which must result, of course, in larger business in this line to the carrying companies.

Under these circumstances it is well worth while for manufacturers and the trade to present the facts to the classification committees with a view to securing the needed modifications. There is reason to hope that a due presentation of the arguments bearing upon the matter will secure the desired action.

As a step toward the correction of existing classifications, it is worthy of note that the American Wire Nail Company, Covington, Ky., recently made complaint to the Interstate Commerce Commission agains the roads in the South whose tariff discriminates against Wire Nails and in favor of Cut Nails, the Southern Railway and Steamship Association having adopted a classification by which Wire Nails are rated as fifth-class goods and Cut Nails as Special Iron, making a difference of from 15 to 20 cents per keg in favor of the Cut Nail. The Southern roads before the commission conceded the facts and agreed to correct the matter.

Trade Topics.

A well-known manufacturing concern write us referring to their experience with a catalogue fiend. They received not long since a letter written in a crude and unbusiness-like hand, requesting them to send their catalogue and best cash prices on their goods in gross lots, and also a sample by mail of one of their well-known articles, with quotations on the same also in gross lots. As the matter did not look entirely straight they addressed a firm in the city from which their correspondent wrote, and received in reply a letter stating that the person in question is what they call a catalogue fiend, answering advertisements and asking for catalogues and price-lists and samples in some cases. They explain that he is a man of all work for a doctor in that city, and amuses himself by writing for catalogues. They add significantly that the manufacturers are apparently getting on to his racket, as they have received other inquiries concerning him.

The statement having been made in one of the English papers that trade in Australia called for cheap goods, even in Edge Tools, without regard to quality, a correspondent of the London *Ironmonger* thus writes:

That keen competition is met with in the Australasian colonies no one will deny; but to suggest that what the colonies require are "cheap goods," and that for these only is there a ready sale, will, I think, be repudiated alike by merchants and manufacturers. For instance, many of our Sheffield firms, the quality of whose goods is indisputable, will no doubt tell you they find no difficulty in selling a good article in Australia. Again and again has it been remarked to me by Australians that they want good quality goods and are willing to pay for them, and that the day has gone by for home shippers to think that "cheap and nasty" goods unfit for home consumption will "go down" in Australia. Of course every buyer is anxious to get as much as he can for his money; but ask any consumer in Australia, and he would no doubt agree in advising your readers not to run away with the idea that any rubbish is good enough for the colonies.

A merchant, referring to maxims which those in business can advantageously follow, quotes the following. Keep up quality; sell low; have some one constantly looking up the business.

Wire Nails vs. Cut Nails.

Perkins Bros., Bridgewater, Mass., issue a circular in regard to mechanical tests made at Watertown Arsenal, Massachusetts, July 6, 1889, as to the adhesion of Cut and Wire Nails. The report is signed by F. H. Parker, lieutenant-colonel commanding, Ordnance Department, U. S. A. It is stated that the Nails were driven to within ½ inch of the head, and the figures given are the natural resistance in pounds. The tables of tests are as follows:

Experiments in Spruce Wood.

	20d.	10d.	9d.	8d.	6d.
Cut Nails	912	491	499	280	283
Wire Nails, barbed	786	437	549	346	258
Wire Nails, improved	1,002	618	604	425	293

Experiments in White Pine Wood.

	20d.	9d.	8d.	6d.
Cut Nails	852	458	243	162
Wire Nails, smooth	648	254	159	122
Wire Nails, barbed	753	360	191	128
Wire Nails, improved	1,000	435	368	247

Perkins Bros. allude to the above tests as sustaining their claim that their improved-finish Wire Nails will hold more than Cut Nails, and refer to the report as doubly significant in view of the disposition on the part of the manufacturers of Cut Nails to reduce the weight of the Cut Nails, thus diminishing their holding qualities.

Obituary.

Samuel T. House, who for more than 50 years had been identified with the Hardware trade of this city, died on the 19th inst., at Madison, N. Y., at the age of 68. His earliest connection with business was in a Hardware store at Utica, N. Y., from which place he came to this city when quite young, accepting a position as clerk in the house of Samuel Roosevelt & Co., who were at that time prominent Hardware merchants. He subsequently became a partner in the concern. As representative of the house he was widely known to the trade of that day, and his friends were accustomed to hear from him interesting references to his early trips in the West, when the stage-coach and private conveyance were the principal means of access from place to place. He was, in fact, among the pioneer commercial travelers. After Samuel Roosevelt & Co. went out of business, nearly 20 years ago, Mr. House became the New York representative of Corbitt, Failing & Co., Portland, Ore., a position which he held until two or three years ago, when he voluntarily relinquished it that he might spend his closing years free from the cares of business. In this position he had the fullest confidence of his house, and was held by them, as by all who were brought in business relations with him, in very high regard. His integrity was unquestioned, and his sincerity, fidelity and other personal and business qualities made him to be highly esteemed and gave to him a host of friends. Since giving up his business his home has continued in Brooklyn, but his summers have been spent at Madison, N. Y., his boyhood's home, where also his death occurred.

Items.

The trade will observe the advertisement on page 69 in which the line of Bells made by the New Departure Bell Company, Bristol, Conn., for whom John H. Graham & Co., 113 Chambers street, New York, are general agents, is illustrated. The cuts given represent the leading patterns of these Bells, and it will be observed that a concise description is given of the different styles, the finish of which is indicated. This announcement is the

more interesting because in addition to calling attention to the goods in a general way so much detailed information is given concerning them that the advertisement answers many of the purposes of a price-list.

Surpless, Dunn & Alder, 97 Chambers street, New York have been appointed general agents for John Kendall & Co., New Lebanon, N. Y., manufacturers of Thermometers, &c., their line including an extensive assortment of Thermometers, Barometers, Hydrometers, &c.

Triumph Wringer Company, Keene, N. H., in their catalogue No. 3 present an interesting line of Iron Toys which are appropriately referred to as artistic in design and finish and at the same time substantial and as light as is consistent with durability. The catalogue represents a lot of Locomotives, Locomotive Tenders and different kinds of Cars, Trains variously made up, and Toy Fire-Engines, Hook and Ladder Trucks, Hose-Reels, Pony-Carts, Horse and Truck and the Triumph Toy Clothes-Wringer. The company allude to their mechanical facilities, the adoption of new methods and their intention of placing Iron Toys in the foremost rank, as well as the fact that entirely new models are being put on the market.

H. Belmer & Co., Cincinnati, Ohio, issue a circular describing the IXL Wire Mat, the advantages of which are pointed out. A price-list is also given, showing that the Mats are made in sizes ranging from 16 x 24 inches to 36 x 72 inches, special sizes and irregular shapes being made to order. They also issue a circular relating to their Adjustable Bale-Ties, showing their special features and giving price-list. These Ties are furnished either with single or double loops.

The Lovell Mfg. Company, Erie, Pa., give in their catalogue a full description of their line of Wringers, Mouse, Rat and Game Traps, the Lightning Cork-Puller and Sampson Truck and the Hamoquette Reclining-Chair. Their line of Rat and Mouse Traps is referred to as specially worthy of attention.

Charles A. M. Krissinger, Berlin, Pa., who for several years had been carrying on the Hardware business, died on the 10th inst. after an illness of only two days. The store and fixtures have been purchased by Mrs. Krissinger and W. L. Kurtz, and the business will be continued under the firm name of Krissinger & Kurtz. Mr. Krissinger is referred to as having enjoyed a wide acquaintance among the trade, a large number of friends in business circles regretting his death.

H. A. Williams Mfg. Company, Taunton, Mass., have issued an illustrated catalogue of the extensive line of Steel, Brass and Tin Oilers which they are putting on the market. The different patterns are represented, with descriptive matter and prices, and also a line of patent Syphon-Vented Steel-Jacket Lamps. The opening circular alludes to the completeness of the machinery and factory equipment as permitting the manufacture of a superior quality of goods at reasonable cost.

The Wills Horse Nail Company, Brighton Park, Ill., began making Horse-Nails several weeks ago and are now prepared to fill orders for Good-Enough Nails. They will extend their product to a full line of the various styles of Nails as soon as the material can be obtained, which will be probably in the course of two or three weeks.

The Samson Cordage Works, of Boston, report having added to their machinery for Braiding Cord and nearly doubled their product since spring. They have also arranged better facilities for waterproofing Cord, to which they have been paying a good deal of attention of late. This finish is referred to as increasing the durability of the Cord to a remarkable degree and as being especially valuable as applied to the Window-Sash Cord, though it also improves materially all Railway Service Cordage.

The Lambert & Bishop Wire Fence Company, Joliet, Ill., on August 19 bought the Wire Nail plant of the Desplaines Mfg. Company, at Joliet, at public sale. The plant is well equipped with the most improved machinery and conveniences for making and handling Barb-Wire, and it is not improbable that the mill will be operated as soon as the demand requires increased capacity.

From our correspondent in Paris we have received copies of circulars from the following manufacturers, which were distributed at the exposition and refer to some of the principal lines of goods there exhibited and brought to the attention of visitors:

American Indurated Fiber Company, Mechanicsville, N. Y., Indurated Fiber-Ware.
Bissell Carpet Sweeper Company, Grand Rapids, Mich., Carpet-Sweepers.
F. F. Adams Company, Erie, Pa., Sampson Cork-Puller and Acme Lemon-Squeezer.
L. & I. J. White, Buffalo, N. Y., Edge Tools.
Sidney Shepard & Co., Buffalo, N. Y., Barler's Sifter.
Revere Rubber Company, Chelsea, Mass., Rubber Belting, &c.
H. Nutrizio, 168 William street, New York, Coffee-Pot.
American Bit Brace Company, Buffalo, N. Y., Braces.
John E. Smith & Son, Buffalo, N. Y., Meat-Choppers.
Bailey, Farrell & Co., Pittsburgh, Pa., Automatic Cartridge-Loader.
International Specialty Company, Buffalo, N. Y., Automatic Twine-Holder.
Enterprise Mfg. Company, Columbiana, Ohio, Feed-Grinders.
A. Reid, Buffalo, N. Y., Steel Portable Ovens.
Standard Target Company, Cleveland, Ohio, Trap-Shooters' Supplies.
Brewington, Bainbridge & Co., Baltimore, Md., Egyptian Tin-Ware.
Miller Lock Company, Philadelphia, Pa., Padlocks, Cabinet Locks, &c.

M. M. Morriss, Glade Spring, Va., announces that he has opened a large and well-selected stock of Hardware at Big Stone Gap, where the business will be conducted under the firm name and style of the Morriss Hardware Company. Hardware will be sold at wholesale and retail, and the company will act as manufacturers' agents and handle the same general line of Agricultural Implements and Machinery as that handled by Mr. Morriss at Glade Spring. The business at Big Stone Gap will be under the immediate control of his son, William S. Morriss, who will be assisted by Joe. C. Maynor, who is referred to as having had control of agencies at Big Stone Gap and in that section of Virginia and Kentucky for the past three years.

Henry A. Uehren, a well-known Hardware man of Galena, Ill., is vice-president of the Galena Fair.

Walbridge & Co., Buffalo, N. Y., issue an exceptionally well printed catalogue showing the line of Lamps they are carrying, including attractive styles of Library and Hall Lamps, an assortment of Table Lamps, in which the Rochester are given a prominent place, Banquet, Extension Piano Lamps, Iron Brackets and Side Lamps, Burners, Lanterns and Street Lamps. Attention is also called to their Globes, Shades and Trimmings and to their large stock of Plated-Ware.

Merriam Mfg. Company, Durham, Conn., have issued a new catalogue and price list of Stationers' Tin Goods of their manufacture. It covers a line of Cash-Boxes, Inside Trays, Stamp-Boxes, Mail-Boxes, Bill-Head, Envelope and Postal-Card Cases, Tin Board Letter and File Clips, &c. Among the new goods to which attention is particularly called are special quality Cash-Boxes, also a third-quality grade to meet the demand for low-priced boxes. In the best goods the Yale & Towne Mfg. Company's Locks are used.

Trade.

From our correspondent in Louisville, Ky., we have the following advices under date September 22:

The Hardware trade of Louisville, Ky., is in a most flourishing condition. Prices on leading lines have advanced just enough to make things lively. Those dealers who were shrewd enough to cover their wants in the principal articles are now reaping a reward for confidence in the advance of prices. The reaction certainly has come, but how long the good time will last is the question that troubles the buyers. Some are bold enough to buy for future wants at advanced prices, while others are conservative and only buy for immediate needs, fearing the decline that has, without fail, for several years followed a spurt. The conservative attitude of the Pig-Iron trade affords a safety-valve to prevent prices on finished goods going up too rapidly or high, and it is a source of comment even among mill men that this staple article does not advance more under strong purchases.

Bar-Iron is firm at considerably higher figures than 30 days ago, one of our prominent mills having refused some heavy orders at to-day's price, as they are full for the present and prefer to trust to higher rates in the future. Quotations are invariably made for immediate acceptance only.

Sheet-Iron is scarce to the belated buyer, the mills being full of contracts. This article is in a very comfortable condition, the supply of light-gauge common Sheets being just about equal to the demand of trade.

Cut Nails have made considerable advances and are now held firm at the $2 rate for 12d at Wheeling. At this price the mills can make some money and propose to stand for awhile, to prevent idle mills starting up. Orders are coming in freely at full prices and very little cutting is being done. There is some talk of the Iron-Nail mills running again. As is usual here and at other centers, the large jobbers are selling at prices below what the mills could lay them down at, but, as the manufacturers made the advance suddenly, it is supposed the trade is not at all overstocked with low-priced Nails.

Wire Nails have moved up to $2.25, at mill, and at this writing it would be difficult to place a large order for future shipments, as some mills have withdrawn these figures, being sold up as far ahead as they desire. The extreme low price on plain Wire was recently withdrawn, which caused the calling in of such low quotations as prevailed on Barb-Wire. The last price made on Barbed was 3¼ cents, Ohio River points, but was made only to be recalled in a few days; 3¼ cents is expected to be the ruling price before long.

Machine Bolts, Lag-Screws and Nuts have crept up a little, and the trade expects soon to see common Carriage Bolts worth more money than at present.

The jobbers are doing a remarkably heavy business and a remunerative one, too, as the advance in prices enables them to make some profit on goods usually carried only as leaders. The crops through Louisville territory were never better, and as a consequence the country merchants are buying freely. There was an unusual amount of agricultural machinery distributed from here this season, and heavy crops of small grain are being sown.

Getting at the Cost of Goods.

The inquiry in a recent issue from a correspondent on the Pacific Coast in regard to the most advisable method of taking account of stock, especially with reference to the cost of the goods as affected by the freight, is one which has been received by the trade with not a little interest, as evinced by the numerous replies which we have received. Some of these letters give specific answers to the inquiry and explain our correspondents' methods of taking account of stock and adding freight as entering into the cost. Others refer to the general question as to the best way of accurately ascertaining costs and describe several different methods which have their advantages, and will be found to be more or less nearly suited to the needs of the trade. There is doubtless in the trade at large much difference as to the care with which the merchant follows his business and the accuracy with which its affairs are looked after. In many stores the business management is lax and there is a neglect of that careful oversight of its details, and in some instances a failure to be advised as to the profitableness of the business transacted, a condition of things which in many instances has been fatal to success. With reference to our correspondent's inquiry, a prosperous house in the Southwest write that "the question in hand is one that has addled more than one brain, and has been the cause of bankruptcy to many a firm—viz., the exact cost of goods." Most of our correspondents refer to the necessity for the merchant to be accurately advised on this point, but some of them point out that this matter can be gone into with so much painstaking and detail that the time consumed in getting at the cost may be unwisely spent, indicating their opinion that an estimate of the cost approximately accurate will be sufficient for all practical purposes. Others give the methods of ascertaining the exact cost, and refer to the importance of so doing.

We give below extracts from some of the letters, which will be found suggestive and interesting and are entitled to weight, coming as they do from representative houses in all parts of the country. The explanation given in them of the methods adopted by the writers will be found deserving of the careful attention of any Hardware man who is desirous of improving his business methods, and thus promoting the success of his business:

ILLINOIS.—Our method of adding freight to cost of goods is about as follows: Fourth-class freight from Chicago to our city is 20 cents per 100 pounds. On Strap and T Hinges, Nuts and Washers, Rivets, Horse-Nails, Toe-Calks, Shot, Borax and such goods as we buy by the pound we add ¼ cent to net cost, which will cover freight, cartage and boxing. On an assorted bill of shelf Hardware we take the freight receipt which classifies the goods and shows amount of freight paid on each class. Then classify the invoice in the same manner and add such per cent. to net cost as charges amount to. About two weeks before we intend to take an inventory we go through the whole stock and arrange and assort everything, and remark such goods as have declined (in case mentioned by your correspondent would mark them down 10 per cent.). Where goods have advanced we take them at cost, because we do not get the benefit of the advance until the goods are sold, and they might decline to original cost before sold. Slow sellers and damaged goods we mark down from 25 to 50 per cent., and in some instances skip them entirely and try and dispose of them at the best price we can get. Such goods we get out in plain sight and work them. When through with the inventory and all footed we deduct 2 per cent. off the whole amount. The net total will be as low as the same amount of goods could be purchased for cash and delivered in our store. Would rather have the inventory a little less than actual value than have it higher.

IOWA.—We think the only correct way to figure cost of freight is on the basis of what the goods weigh and the cost for 100 pounds. It would not be correct to figure the weight on Nails on the percentage basis, but it is correct to add what it costs per keg. We apply this principle to all lines on which we can get weight, &c., and mark on each invoice received the amount of freight paid, the rate per hundred and percentage of freight. On many lines in Hardware, such as Cutlery and small shelf goods, the percentage basis is the only way freights can be figured, and where it is figured on each and every invoice buyers soon become familiar with the per cent. of cost for freight that each line of goods takes, and can and should keep that as an item of cost the same as the factory cost. We keep in our cost-book factory cost, per cent. of freight, and delivery cost on every line of goods we sell.

MICHIGAN.—I am afraid we cannot help your Pacific Coast inquirer in regard to freight charges, with special reference to stock-taking. We note "Pacific Coast" adds freight to cost of goods when he marks them. He does not say that he adds the cost of the time of the man who marked them and places them on the shelf for sale, nor the cost of dusting and keeping in condition to sell. But we see no reason why he should not do it if he adds anything to the cost of the goods except the cost at place of purchase. We keep a freight account separate from everything else, and inventory our goods at all times at their cost value in the market, and don't let freight enter into the matter at all. Of course this freight account is expense, as are other matters, like fuel and light, hired help, taxes, &c., but we keep them all separate until the end of the year, when we know just what any of them have cost us. If we should add any of them to our cost-mark on goods we should not know where to stop until we had them all added in. Of course goods in which the freight is a considerable item of cost must bring a larger profit above cost than goods that have smaller freight charges. We do not know if our way would be best for the Pacific Slope or any place where freight is a large item, but still we should prefer to have our freight in one separate account than to try and scatter it through our stock.

OHIO.—I always add freight, package and cartage to bills of goods when received and mark them net. My method of taking account of stock is to put my goods at present valuation. If there has been a shrinkage in some portion of my goods I reduce the cost and selling price; if they have advanced I advance the cost and selling price. If it costs 5 or 10 per cent. to place goods in my store I always add the amount to the cost of my goods, and the consumer must pay the difference between the Eastern and Western market. The merchant has paid for the transportation of his stock in trade and it must be added to the cost of his goods.

MICHIGAN.—Our method has been to price our goods on some particular date at prices ruling at that time in the markets in which we found it most convenient to supply our trade, adding freights on staple goods that we carried in sufficient quantity, such as Wire Nails, Glass, &c. On all other goods we figure no freights, allowing some for damage to samples and possible decline in value on account of being unseasonable, &c. If exact cost is wanted it must be figured at time of stock-taking, same as at time of reception of goods. I know of no one who does this, and my impression is that a large percentage of stock-taking is done on some average method, depending, of course, on location and kind of goods carried.

MAINE.—Our freights from Boston and New York cost us from 30 to 60 cents per 100 pounds, according to classes. In taking stock we try to figure our stock at present cash value, or at what we can replace the goods, but as life is too short to spend too much of it in figuring the exact cost we allow sufficient margin so that it shall be under rather than over. In marking our goods we usually take freight and cartage here; also boxes and cartage (if we have to pay it, which we dislike to do) and find the expense on that special invoice, and mark the goods according to the per cent. of expense, adding the same per cent. to each article. It may not be right, but it satisfies us, and we let it go at that.

FLORIDA.—My practice after about 25 years' experience in taking stock and marking goods is as follows: I take net of invoice and see what per cent. the freight, drayage and boxing is to same and add to original net cost, which makes goods cost me in store net with above items added. I figure each invoice separately. In this part of the country the per cent. runs from 10 to 34, owing to kind of goods bought. I mark all my goods as above, and in taking stock call them cost, excepting staples, such as Nails, Wire, Iron, &c., or goods that are changing in price. These I figure at cost at time of invoicing, which with me is June of each year. I do my own marking of goods, consequently am familiar with house-keepers', shop-worn or out-of-style goods, and these I invoice according to my own judgment.

COLORADO.—Our goods cost us for freight from 2½ to 20 per cent. over Eastern cost. We figure the exact cost of each article and each size because we have to. There are very few lines that we can figure the cost by a certain per cent. for freight, but we weigh the goods and add so much per pound, varying from about 1¼ cents to 14 cents per pound, according to the character of the goods. If prices decline after goods are bought we refigure them and make present value our basis in figuring cost, and after total inventory is taken we make a still further discount of, say, 5 per cent. If we have any dead stock we do not figure it in; slow stock moving in such a way that it has to be forced we cut the cost off, on the principle that we do not wish to cheat ourselves. In other words, we bring our inventory down to the lowest figure in every way. We take stock by floors and sections, running continuously around the store and not skipping about. In the inventory-book we have an index by floors, 1, 2, 3, &c.; sections marked Right, 1, 2, 3, &c.; Left, 1, 2, 3, &c.; Show-case, 1, 2, 3, &c.; Counters, 1, 2, 3, &c., all through the book. The stock is divided off in the same way. We also have an index of the staple goods, such as Bits, Butts, Axes, Planes, Locks, &c., so that we can turn at once to the location or the article, wherever it is in the book. We find this method very convenient, as we have occasion to refer to the stock-book many times in a year. In pricing stock and refiguring in a hurry, as we have to do, we would not try to get along without Ladd's "Discount Book." It is a great labor-saver.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Animal and Vegetable Oils.

There have been no important developments in this branch of trade the past week. The situation in the Cotton-Seed-Oil branch remains unsettled, with prices for the product weak, the demand moderate, the cost of seed high, and some evidence that the handiwork of the trust is responsible for this unenviable position. The Linseed-Oil trust having no extensive independent competition to contend with or make war upon, is pursuing the reverse course and keeping prices of Oil up to a parity of the cost of the raw material. In other lines affairs seem to be governed wholly by natural influences, and, while values show some little variation in a few instances, no radical changes are to be recorded for the week. Outside of the Cotton-Seed-Oil branch business seems to be moving along smoothly, and as a whole the distribution is fairly up to the average volume for the season.

Linseed-Oil.—The volume of business in city-made Oil has been rather more extensive than during the preceding week. Comparatively little "outside" State product is offered here at the present time, and the arrivals of Western are small. For "outside" brands less than 58¢ is exceptionally low price, and local crushers experience no difficulty in obtaining 60¢ for raw Calcutta seed product.

Cotton-Seed-Oils.—Receipts of new Oil have been larger, and afford a very fair spot supply to draw from. Buyers are taking only small lots, however, and are very exacting on every detail as to quality and condition. Good grades of crude are let go at 32¢ @ 33¢; fair to prime Summer Yellow at 38¢ @ 40¢, and choice Summer Yellow at 42¢. Exporters still assert that "trust" agents are offering stock in large lots at prices on a parity of 35¢ here for the refined article, or so low that they cannot purchase here and ship except at a loss. The Lard-refiners, it is said, have made comparatively few contracts thus far.

Lard-Oil—Has been remarkably steady throughout the week. Pressers state that there has been a more even demand than for considerable time past, and that fact, coupled with steadier prices for the crude material, has given the market more tone. There has been no change in quotations.

Menhaden-Oils.—Crude oil has been fairly active during the week and steady. Fully 2000 barrels are said to have changed hands at about 21¢ for dark, 22¢ for good merchantable and 23¢ for pale. The fishing on the Sound has been good and the outturn of oil quite large. Pressed and Bleached Menhaden and Tanners' Oils have had very steady sale at previous prices.

Sperm and Whale Oils—Remain very steady at old prices. There has been no important movement of crude, but the manufactured goods have met with fairly liberal sale, including fair quantities of Sperm products for export.

Cocoanut-Oils—Have been rather slow. Ceylon on the spot is firmly held and Cochin is still very scarce. The former is offered at 5⅞¢ and the latter at 6¾¢ to arrive.

Olive-Oil—In barrels has weakened a trifle, Spanish having been sold at as low as 70¢ @ 71¢ on the spot.

Paints and Colors.

There has been a freer movement of Paints and Colors generally the past week. More favorable weather has permitted progress with building operations and repairs that had previously been delayed, and this in turn brought a good many local buyers into the market, besides a liberal amount of orders from near-by points. While greater numerically, the purchases have been of merely ordinary character, reflecting a generally conservative tendency on the part of jobbers and large retailers No specially new influences bearing upon values have appeared and the general market retains a very steady tone. The outlook for near future business is considered flattering in most departments and a continuation of present steadiness to values seems very probable. The Lead, Zinc, Color and Ready-Mixed Paint manufacturers are apparently in fairly-good position and importations of foreign goods appear to be remarkably well adjusted to the trade requirements.

White Lead.—In this branch there have been no new developments. The prices and rebates heretofore ruling are adhered to by the "trust," and the few remaining "independent" manufacturers are not found to be departing from the official terms. Jobbers are still giving good customers nearly the full regular discounts and rebates in not a few instances, however, but practice has little or no influence upon manufacturers. Transactions have been more extensive the past week than during the preceding fortnight and the market is fairly active at the present time.

Red Red and *Litharge.*—The demand for these pigments has improved somewhat and manufacturers report a very good business for the week. Prices and rebates have not been changed.

Orange Mineral.—Domestic is steady at the old prices, but imported stock seems still to have the preference with most buyers at about ½¢ ℔ lb over the prices for American. There is a very fair business passing.

Zincs.—American Oxide is still moving quite freely, and little or none accumulates on manufacturers hands. Prices therefore remain firm, but are without quotable change. Foreign Zinc is offered sparingly, and prices for the various brands remain very firm.

Colors.—French Ochers have met with very fair sale, as have also American, at practically former prices, and the same is to be remarked of Sienna, Umber, Venetian Red and grinders' colors in general. Paris Green and other "insecticides" are rather slow, but there is a very good movement of Painters' Colors, dry and in oil, at previous prices. Ready-mixed Paints sell to a quite liberal extent.

Miscellaneous.—Very little Chalk is arriving, but buyers are well stocked and prices are still low. Whiting is fairly active, but irregular, with over 40¢ for Common or 55¢ for Gilders' obtained for small quantities. Paris White has met with very fair movement, and is showing but slight variation in price.

Wholesale Prices.

NEW YORK, September 24, 1889.

Animal and Vegetable Oils.

Linseed, City, raw	per gal	60	@	..
" " boiled		63	@	..
" Western, raw		..	@	58
Lard, City, Extra Winter		54	@	55
" " Prime, present make		52	@	53
" " Extra No. 1		47	@	48
" " No. 1		42	@	44
" Western, prime		51	@	53
Cotton-seed, Crude, prime		32	@	33
" " off grades		30	@	31
" Summer Yellow, prime		40	@	42
" " " off grades		38	@	39
Sperm, Crude		61	@	62
" Natural Spring		67	@	68
" Bleached Spring		72	@	73
" Natural Winter		74	@	75
" Bleached Winter		80	@	..
Whale, Crude		39	@	40
" Natural Winter		45	@	46
" Bleached Winter		47	@	48
Whale, Extra Bleached		49	@	50
Sea Elephant, Bleached Winter		54	@	55
Menhaden, Crude, Sound		21	@	23
" Crude, Southern		21	@	23
" Light Pressed		28	@	29
" Bleached Winter		34	@	..
" Extra Bleached		38	@	39
Tallow, City, prime		..	@	50
" Western, prime		..	@	47
Cocoanut, Ceylon		5½	@	5⅝
" Cochin		6¾	@	7
Cod, Domestic		31	@	32
" Foreign		34	@	35
Red Elaine		36	@	38
Red Saponified	℔ lb	4½	@	4¾
Bank	per gal	25	@	26
Straits		27	@	28
Olive, Italian, bbls		71	@	73
Neatsfoot, prime		62½	@	75
Palm, prime, Lagos	℔ lb	..	@	5¾

Mineral Oils.

Black, 29 gravity, 25 @ 30 cold test,	per gal	8	@	9
" " 15 " "	"	8½	@	9½
" " summer	"	6	@	7
Cylinder, light, filtered	"	15	@	20
" dark, "	"	14	@	20
" " steam refined	"	10	@	18
Paraffine, 23½ @ 24 gravity	"	11	@	12
" 25 "	"	10	@	11
" 28 "	"	8½	@	9
" red, 21 @ 22 gravity	"	14	@	14½
" " 22½ @ 23 "	"	12	@	13

Paints and Colors.

Barytes, Prime White	℔ ton.	$21.00	@	21.50
" American Refined		18.00	@	20.00
" " No. 1		16.00	@	17.00
" " No. 2		14.00	@	15.00
" " off-color		12.00	@	.....
Blue, Celestial	℔ lb	5½	@	7½
" Chinese		45	@	50
" Prussian		20	@	35
" Ultramarine		7	@	25
Brown, Spanish		½	@	1
" Vandyke, American		3	@	3½
" English		6	@	8
Black, American Drop		8	@	10
" English "		12	@	14
" Frankfort "		5	@	18
Black, Lamp, common		12	@	18
" " medium		19	@	25
" " prime		27	@	33
Carmine, No. 40, in bulk		3.10	@	..
" " in boxes or barrels		3.20	@	..
" " in ounce bottles		4.20	@	..
Chalk, in bulk	℔ ton.	.....	@	2.00
" in bbls	℔ 100 lb	30	@	40
China Clay, English	℔ ton.	13.50	@	18
" Southern		10.00	@	11.50
Cobalt Oxide, prep'd		2.90	@	..
" " black lots 100 lb		2.60	@	..
" " " less "		2.65	@	..
Crocus Martus, English	℔ lb.	1½	@	2½
" American		1½	@	2½
Green, Paris, in bulk		20	@	..
" " 170 @ 175 lb kegs		20½	@	..
" " small packages		22	@	26½
" Chrome, ordinary		8	@	11
" " extra		12	@	13
" " pure		23	@	25

REBATES, &c.—Paris Green.—Rebates to buyers of 500 to 1000 lb during season, ½¢ ℔ lb; to buyers of 1000 to 2000 lb. 1¢; to buyers of 2000 to 4000 lb, 1½¢; to buyers of 4000 to 10,000 lb, 2¢, to buyers of 10,000 lb and over 2½¢. Buyers of 5 tons or over at one time receive an additional ¼¢ ℔ lb.

Lead, American White, dry		6¾	@	7
" " in oil		7	@	7½
" " Red		6¾	@	7
Litharge, in barrels		6¼	@	..
" " 500-lb lots		7	@	..
" " smaller "		7¼	@	..

REBATES, &c.—White Lead. ½¢ ℔ lb rebate on purchases of 500 lb and over, if paid for within 60 days of date of invoice; terms, 60 days or a discount of 2½ % if payment within 15 days from date of invoice. Extra rebate of ½¢ ℔ lb, payable July 1 and December 31 to buyers of a total of 10 tons pure Lead during the year.

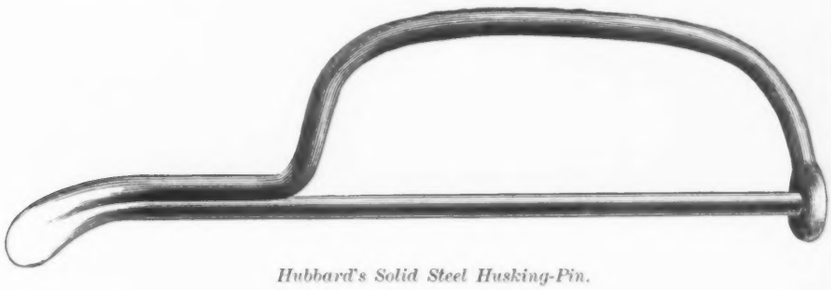
Litharge.—Rebate of ½¢ ℔ lb for cash in 60 days and 2½ % additional for cash in 15 days.

Ocher, Rochelle		1.35	@	1½
" French Washed		1½	@	2½
" German Washed		1¼	@	3
" American		½	@	1¼
Orange Mineral, English		8½	@	9½
" French		9	@	9½
" German		8½	@	9½
" American		8	@	8½
Paris White, English Cliffstone		90	@	1.10
" American		70	@	80
Red, Indian, English		5½	@	7
" " American		2	@	6
" Turkey		9	@	14
" Tuscan		9	@	11
" Venetian, American	℔ 100 lb.	90	@	1.25
" " English		1.00	@	1.45
Sienna, Italian, Burnt and Powd.	℔ lb	5	@	6¼
" " Burnt Lumps		1½	@	3½
" " Raw, Powdered		5	@	6½
" " " Lumps		2	@	3½
" American, Raw		1½	@	1¾
" " Burnt and Powdered		1½	@	1¾
Talc, French		1¼	@	1½
" American		1	@	1¼
Terra Alba, French	per 100 lb	72½	@	80
" English		80	@	85
" American No. 1		70	@	75
" American No. 2		38	@	40
Umber, Turkey, Bnt. and Powd.	℔ lb	3½	@	4
" Burnt, Lumps		2¾	@	3
" Raw and Powdered		3½	@	4
" Raw, Lumps		2½	@	2¾
" Burnt, American		1¾	@	1¾
" Raw, "		1¾	@	1¾
Yellow, Chrome		10	@	25
Vermilion, American, Lead		11½	@	13
" Quicksilver		65	@	70
" English Imported		82	@	85
" Imitation English		8	@	25
" Trieste		75	@	77
" Chinese		88	@	90
Whiting, Common	℔ 100 lb	40	@	45
" Gilders'		55	@	65
Zinc, American, dry	℔ lb	4¼	@	4¾
" French, Red Seal		..	@	7½
" " Green Seal		..	@	7½
" " V. M. X		6	@	6¼
" Antwerp, Red Seal		..	@	7
" " Green Seal		..	@	7¼
" German, L. Z. O		..	@	6
" V. M. in Poppy Oil, G. Seal, lots of 1 ton and over		10	@	10¼
lots less than 1 ton		10¼	@	10¾
Zinc, V. M. in Poppy Oil, Red Seal, lots of 1 ton and over		..	@	..
Lots of less than 1 ton		9¾	@	9¾
		9¾	@	10

DISCOUNTS.—French Zinc.—Discounts to buyers of 10-bbl. lots of one or assorted grades, 1 %; 25 bbls, 2 %; 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Hubbard's Solid Steel Husking-Pin.

The husking-pin shown herewith is manufactured by the Ashtabula Husker Company, Ashtabula, Ohio, the cut representing the largest-sized husker full size. This pin was patented August 27, 1889. It is described as made of special spring steel wire, the point being formed under a drop-hammer hot. It can be straightened or bent by the user as desired. The husker may be used with or without



Hubbard's Solid Steel Husking-Pin.

gloves. It is made in three sizes and packed one-half gross in neat telescope-boxes and also in cases containing ten gross.

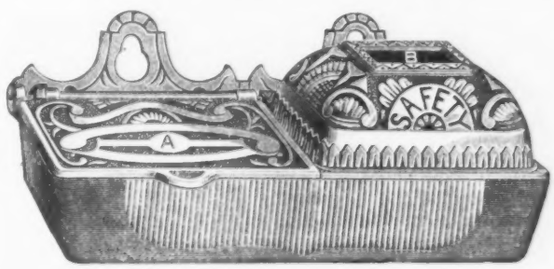
The Centennial Door-Bell.

Tommins & Adams, 116 Chambers street, New York, are placing on the market a new door-bell which is illustrated in the accompanying cut. Since the introduction of the electric bell it has been the aim of manufacturers and inventors to produce a door-bell that would give the same results without the aid of electricity. These, it is claimed, are secured by the use of this door-bell. A ½-inch stroke of the lever shown produces 35 distinct taps on the gong, no winding thus being necessary. The sound is produced by a rotary vibrating movement of the hammers, and the bell is so constructed that the pressure on the lever tightens and loosens the spring operating on the hammers. Emphasis is laid on the fact that this bell can be used in any part of the house by the employment of wires, or can be placed directly on the door. No special fixtures are required, and it can be used with any style of bell-pull The bell is of attractive appearance, the gongs being nickel-plated and the frame being either japanned or bronzed as desired. The goods are packed one bell in a box. The strength, durability and low price of the bell are points made in regard to it.

The Centennial Door-Bell.

A Place for the Burning Match.

A match-safe is not a new article, but a *safe* match-safe is an article heretofore unknown. The careless use of matches has long been the cause of a large percentage of the fires that have swept over the country. The new and novel device patented and manufactured by E. P. Hasbrouck, Syracuse, N. Y., as shown by the accompanying cut, supplies a long-felt need. In addition to a neatly-arranged match-safe, A, there is a covered chamber, B, separated from the match chamber by a metal partition, for the reception of the burning match, and its construction is referred to as insuring the smothering of all fire. It is thus a suitable and safe receptacle. The treacherous little incendiary after we have lighted the gas, &c., has ever been a puzzling question. The invention meets the wants of factories, public buildings, and in fact every place where matches are used. It is so constructed as to allow of its being emptied and cleaned of burnt matches without disturbing the unused matches. It may be placed on the mantel or attached to the wall. The design and finish are ornamental, adapting it for use in the home, but it will be especially appreciated in hotels and public places generally, where the careless use of matches is a constant source of danger to life and property. Its very low cost is also referred to.



Combined Match-Safe and Match-Receiver.

New Departure Call-Bell.

The New Departure Bell Company, Bristol, Conn., for whom John H. Graham & Co., 113 Chambers street, New York, are general agents, are manufacturing the bell shown in the accompanying illustration. One of the chief features of this bell is the exact reproduction of the sound of an electric bell, this being accomplished by the aid of a spring and other mechanism in its base. The manufacturers refer to the bulkiness and unwieldiness of electric bells when it is attempted to crowd the battery and attendant parts into the small space necessary to adapt it for use on office-desks, tea-tables, &c., and emphasize the utility of their bell for office use. The bell is operated by the lever shown in the engraving, which upon being depressed causes the bell to ring, the duration of the ring being coincident with the pressure. The winding of the bell is readily effected by simply turning the gong. When fully wound up the bell intended for office use will give, it is said, 300 calls of ordinary duration. This bell is 4½ inches wide at the base, the gong being 3½ inches wide. The tea-bells are 3½ inches wide at the base, the diameter of the gongs being 2½ inches. One winding of the latter is referred to as producing 200 calls of ordinary duration. The bell is made in a variety of styles, nickel-plated, old copper, oxidized silver, silver-plated, &c.

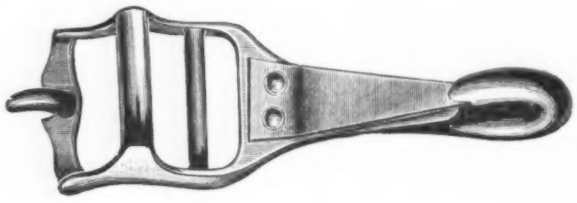
New Departure Call-Bell.

The Myers Improved Glass Valve-Seat.

F. E. Myers & Bro., Ashland, Ohio, have adopted a new method of placing the Myers Glass Valve Seat in pump cylinders, an illustration of which is presented in the accompanying engraving. The seat represented herewith is described as non-corrosive and smoother and more perfect than a metallic seat. It is very hard and does not throw off any corrosives, and the

The Myers Improved Glass Valve-Seat.

leather operating on the glass retains its softness. Special attention is directed to the mode of holding this glass seat. The valve-cap is turned out perfectly true, the glass being underlaid with a rubber gasket. The leather check-valve is placed on top of the glass, as indicated in the cut, and the glass seat and check-valve are held



Ideal Snap.

firmly in place by a brass follower which can be drawn up tightly, thus holding the check-valve and glass seat securely. The fact that the valve-seat and check-valve are entirely independent of anything else and cannot be affected by the swinging of the suction-pipe, or become disarranged in taking the pump or cylinder apart, is also alluded to. This device is now used in all the pumps and seamless drawn brass and porcelain-lined cylinders of all sizes manufactured by the above firm.

Steel-Bowl Wagon-Truck.

The Kilbourne & Jacobs Mfg. Company, Columbus, Ohio, are manufacturing the article above named and shown in the accompanying illustration. It is designed especially for use in bolt-works, machine and blacksmith shops, &c. The wheels are 7½ inches in diameter, with 2½-inch face. The tongue is ⅞ round iron, and when turned down stands at convenient hight for use, not touching the floor. The front wheels turn under the bowl. The latter is pressed from a single sheet of steel and is painted black. All parts of

Steel-Bowl Wagon-Truck.

the truck are well bolted together. The strength and durability of this truck are referred to by the manufacturers. It is made in six sizes, the bowls being in all 6 inches deep, and ranging from 16 x 24 inches to 20 x 40 inches, which weigh respectively 84, 87, 91, 90, 95 and 100 pounds.

Ideal Snap.

This snap is illustrated in the cut herewith given, and is manufactured by Pratt & Letchworth, Buffalo, N. Y. The manner of its use will be inferred from the engraving, from which it will be seen that no stitching or riveting is required to secure the trace in place. The cheapness, strength and durability of this snap are pointed out. It is made bronzed in five sizes, ⅝, ¾, ⅞, 1 and 1¼, and is said to be meeting with a gratifying sale.

The Dixie Back-Band Hook.

The article illustrated in the accompanying engravings is manufactured by Pratt & Letchworth, of Buffalo, N. Y. Fig. 1

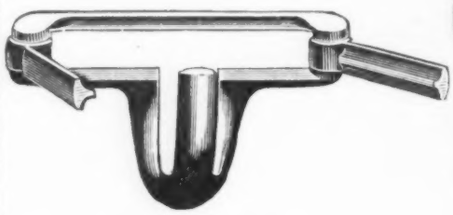


Fig. 1.—The Dixie Back-Band Hook.

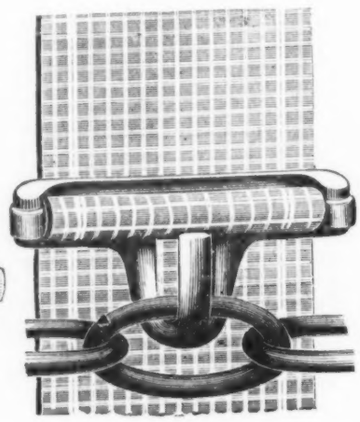


Fig. 2.—Used in Connection with Back Band and Trace-Chain.

represents the hook itself, while Fig. 2 presents a view of the hook used in connection with the back-band and a trace-chain, the method of securing the former being obvious. The strength, ease of adjustment and inexpensiveness of the hook are referred to, the fact that it is not possible for it to slip on the web being especially emphasized. The hook is made under a patent dated March 12, 1889.

The Philadelphia *Inquirer* says that the Pennsylvania Railroad's earnings in the month of August were the largest in the history of the company. August, 1888, gross earnings ran up to $5,390,000; August, 1889, may exceed $5,500,000. Should the traffic hold up as well as is expected the officers expect to come out at the end of the year with $1,000,000 greater earnings than last year. Then, after paying all charges and dividends, a surplus of $1,620,000 was carried forward. The present indications are that traffic this fall will be unusually heavy. The iron establishments along the line of the road are all doing well and the movement of coal and other profitable freight is very great. Local business is fully up to expectations and through traffic is the heaviest for a long time. The usual dividend will be declared in November.

Perfection Flour Bin and Sieve.

Sherman, Tangenberg & Co., 34 Randolph street, Chicago, Ill., are manufacturing the article shown in the engraving herewith given. The bin is made of four-ply card-board, supported by wood and metallic hoops, and is lined inside with white manila paper. The outside is painted two coats, wine color, and varnished, the letters shown in the illustration being in bronze. The sieve is in the bottom of the bin just above the drawer, the cut showing the latter partly pulled out. The turning of the crank directly above the drawer operates a reel inside the bin, which agitates the flour, thus causing it to pass through the sieve into the drawer. The manufacturers point out that by the use of

Perfection Flour Bin and Sieve.

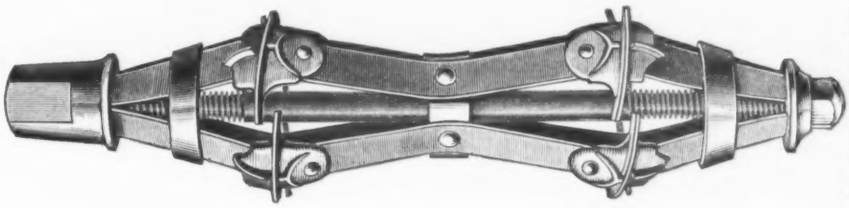
this bin the flour may be kept dry and free from dirt, and that mice, rats and roaches will not attack the bin, owing to the taste of the composition of which it is made. Old flour or meal must be used first, as the bin is replenished at the top. The rapidity with which the device may be operated and its convenience are points also emphasized. Two sizes are made, holding 25 and 50 pounds.

Commercial terms are sometimes an enigma. A dealer in castor beams had occasion recently to test the Western

market, and sent forward a letter inquiring the price "f.o.b." A dispatch came back to the effect that the party did not understand the term "f.o.b.," but if it meant "forward old beams," he must say that he had none in stock.

Duplex Tube-Cleaner.

The Duplex Tube-cleaner we herewith illustrate has been long and favorably known in its single form. The new



The Buffalo Duplex Tube-Cleaner.

cleaner consists in reality of two single cleaners united end to end, as shown in the engraving, the construction being so modified as to permit of this. The springs are tempered steel, and can be set up in the tube so as to scrape out all accumulation and still are perfectly elastic. The double set of scrapers, being in the center of the springs and supported by them, cannot be broken off, no matter how hard usage the article receives. There are no bolts, nuts, wire or coil springs to be affected by hot tubes. The scrapers can be set up and slackened quickly, while the pointed end facilitates its entrance into the tube. This cleaner is made in all sizes from 1½ to 6 inches by Felthousen & Sherwood, of Buffalo, N. Y.

New Designs in Stove-Boards.

The Adams & Westlake Company, Chicago, have just brought out a new design in stove-boards manufactured from one piece of tin and called the Adams. The cut shows the board finished in what they term silver bronze and mother-of-pearl. The Adams is wood lined and made in three styles, round, square and

Design of Stove-Board, Made by the Adams & Westlake Company.

oblong, and in three sizes. Each board is inclosed in a separate paper case, which prevents tarnishing from handling or being exposed to damp atmosphere. The same sizes are made in oxidized zinc and painted in dark blue. It is said that this is the first successful attempt to produce the mother-of-pearl effect on tin or other kindred metal. They issue a six-page price-list circular printed in red and black, in which they show a number of new designs in wood and paper lined oxidized, embossed and crystallized zinc boards for the fall trade.

Ratchet Auger-Handle.

The accompanying illustration represents a new auger-handle embodying several new features, which is put on the market by the Millers Falls Company, Millers Falls, Mass., and 93 Reade street, New York. The illustration indicates the manner in which the handles are attached, and shows the general construction of the tool, the operation of which can thus be readily inferred. If desired the action of the ratchet can be prevented and the handles held rigid. The cut also indicates the manner in which the handle can

Ratchet Auger-Handle.

be used in a place in which there is not room for turning it, one of the handles being taken out and inserted in the top, as shown. The chuck is adapted for use with an auger with nut, or it can be used with an auger-bit. The tool is well made, and is regarded as meeting the want of the trade for such an article.

Columbia College Improvements.—When Columbia College reopens early in October it will have added to its facilities for instruction a new department of electrical engineering and new facilities for instruction in mechanical engineering. A new building 60 x 60 feet and four stories high has been constructed over the boiler-room on the east quadrangle. One floor will be used for the mechanical-engineering department and will be thoroughly fitted up with all the necessary appliances. It will be connected with the boiler-room and supplied with ample motive power. It will have a complete outfit for thorough instruction in mechanical engineering. The floor devoted to electrical engineering will be supplied with the most advanced modern mechanism in this department. It will have several powerful dynamos, motors, testing apparatus and every known device for the study of electricity as now applied to the practical methods of life. It is not yet settled how many students can be instructed in the electrical department, but the indications are that the fullest capacity of the new arrangements will be none too great for the number who wish to avail themselves of this new departure of Columbia. The new building will have a large lecture-room and laboratory, and the instruction will be under the supervision of Prof. William F. Trowbridge, who now has charge of the Department of Civil Engineering and Sanitary Engineering.

Profit-Sharing.—According to the *German Trade Review*, of Berlin, a very remarkable profit-sharing arrangement has been made in the engineering works of G. A. Schutz, in that city. This gentleman, it appears, has placed 5 per cent. on the amount of their annual wages in the local savings-bank to the credit of all those who have worked in his establishment uninterruptedly for a space of five years, ending July, and for all others he has paid 3 per cent. into the savings-bank. These payments will be continued each year, and at the end of five years, in 1894, each person will have the right to withdraw the sum standing in his name, together with the interest. Sickness and military service will not be regarded as interruptions in the employment. In case of death the relatives will receive the amount paid in. Mr. Schutz evidently desires by these means to retain in his establishment a body of trustworthy workmen.

Work on the Superior Street Cable Road in Cleveland has begun.

Petroleum for Engines.

In his annual address before the section of Mechanical Science of the British Association, the president, W. Anderson, spoke as follows on petroleum as a fuel:

It is especially convenient, cleanly, and economical. Stored in tanks of suitable construction, it is sprayed into the furnace without labor and without creating dust and dirt, and it is especially convenient in locomotive and marine work on account of the rapidity, ease and cleanliness with which it can be run into the tender or into the oil-bunkers of a ship. As a working agent in heat engines it is employed in two ways. First as a vapor, generated from the liquid petroleum contained in a boiler, very much in the same way as the vapor of water is used in an engine with surface condenser, the fuel for producing the vapor being also petroleum. Very signal success has been obtained by Mr. Yarrow and others in this mode of using mineral oil, especially for marine purposes and for engines of small power. There seems to be no doubt that by using a highly volatile spirit in the boiler a given amount of fuel will produce double the power obtainable by other means, and at the same time the machinery will be lighter and will occupy less space than if steam were the agent used. The other method is to inject a very fine spray of hot oil, associated with the proper quantity of air, into the cylinder of an ordinary gas-engine, and ignite it there by means of an electric spark or other suitable means. Attempts to use oil in this way date back many years, but it was not until 1888 that Messrs. Priestman Brothers exhibited at the Nottingham Show of the Royal Agricultural Society an engine which worked successfully with oil the flashing-point of which was higher than 75° F., and was therefore within the category of safe oils. The engine exhibited was very like an ordinary Otto gas-engine and worked in exactly the same cycle. A pump at the side of the engine forced air into a small receiver at a few pounds pressure to the square inch. The compressed air, acting by means of a small injector, carried with it the oil in the form of fine spray, which issued into a jacketed chamber heated by the exhaust, in which the oil was vaporized. The mingled air and oil was thus raised to a temperature of about 300° and was then drawn, with more air, into the cylinder, where, after being compressed by the return stroke of the piston, it was exploded by an electric spark, and at the end of the cycle the products of combustion were discharged into the air after encircling the spray-chamber and parting with most of their heat to the injected oil. The results of careful experiments made by Sir William Thomson and by myself on different occasions were that 1.73 pounds of petroleum were consumed per brake horse-power per hour, but the combustion was by no means perfect, for a sheet of paper held over the exhaust-pipe was soon thickly spattered with spots of oil.

At the Windsor show of the Royal Agricultural Society this year, Messrs. Priestman again exhibited improved forms of their engine. The consumption of oil fell to 1.25 pounds per brake horse-power per hour, and a sheet of paper held over the exhaust remained perfectly clean. They also showed a portable engine of very compact construction and quite adapted to agricultural use; the ordinary water-cart which has in any case to attend a portable steam-engine being adapted to supply the water necessary to keep the working cylinder of the engine cool.

An invention has recently been registered by Harrison's Iron and Steel Plate Working Company, Birmingham, England, which claims to remedy the defects of the various nailless horseshoes already before the public. The shoe consists of an upper of thin sheet-steel, which is fastened on the hoof by means of patent machinery fitted to the heel-plate. The patent fastening arrangement consists merely of a swivel-bolt which operates on a leather or copper band passing completely round the hoof. Any pressure that can possibly be required can thus be applied to the upper. It is declared that the shoe can be easily put on or removed by the most inexperienced person in two minutes. The only necessary tool is a small clock-key, such as may be carried in the waistcoat pocket. The interior of the slipper is completely lined with India rubber.

Sorting Freight-Cars by Gravity.—In the great Edgehill yard of the London and Northwestern Railroad, near Liverpool, the sorting and "marshaling" of freight-cars is done by gravity. It comprises over 57 miles of track and cost £2,000,000. Through this yard, says the *Railroad Gazette*, all the outward and inward freight traffic of the London and Northwestern passes. About 3000 cars are handled in 24 hours as a maximum, not as an average, but the yards have a capacity of 5000 to 6000 cars per day. Some 54 trains are made up and sent out between the hours of 4 p.m. and 6 a.m. All cars arriving from Liverpool to be sorted and made up are hauled to the summit of an incline and deposited on the reception lines. From these they are dropped by gravity through the sorting sidings and "gridiron" tracks, and come out made up in trains, the cars arranged in the order of the stations at which they are to be left. From 80 to 83 men are employed. We have no estimate or statement of the relative economy by which the great expenditure for this yard is justified, but Mr. Ackworth, in his recent book, "The Railways of England," states that the work done there in 1887 "implied the employment of the whole time of nearly 400 engines, which collectively performed about 2,000,000 hours' work, at a total cost of precisely £497,437."

The new dry-dock just completed at the Norfolk Navy Yard was formally opened in the presence of a large gathering. Among the number were prominent representatives of navy, army and business men of New York and other cities It took just one hour to pump the dock full, with 8,000,000 gallons of water, and the same length of time to pump out the caisson. At a quarter of 12 o'clock the dock was ready and the United States steamer Yantic, decorated with bunting and her band playing the national anthem, came into the dock under her own steam. The great pumping apparatus, with a capacity of 80,000 gallons a minute, was supplied by a Philadelphia firm.

The E. & T. Fairbanks Scale Company have declared a semi-annual dividend of 3 per cent. for payment October 1. A general statement accompanies the dividend notice, reviewing the operations of the year, and expressing belief that the current year's business will compare favorably with that of the last two years.

There is considerable activity in Southern railroad circles. It is now given out that the Mobile and Ohio are making every effort to get an entrance into the Alabama coal-fields. President Clark and Manager McLaren of that line are making an inspection for the company, who contemplate the purchase of the Tombigbee franchise and an extension of the Artesia, Miss., branch from Columbus, Miss., on into the Alabama mining region, the ultimate destination being Birmingham. It is generally understood that the Louisville and Nashville have purchased the Tennessee and Coosa, and will immediately extend it to Gunthersville, on the Tennessee.

Traffic across the Brooklyn Bridge increases at the rate of about 10 per cent. per annum. No seer's vision is needed to discover that in the near future the terminal facilities at both ends must be vastly enlarged. Given adequate loading and unloading facilities and a proper arrangement of tracks, the capacity of the bridge would be governed by the headway allowed trains. This could be placed at 40 seconds and perhaps a little lower. It is not considered advisable to increase the dead load by making the structure a "double-decker."

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CURRENT HARDWARE PRICES.

SEPTEMBER 25, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.—

Caps, Percussion, ℔ 1000—

Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....46@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....46@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.60

Cartridges.

Rim Fire Cartridges.....50&5&2 %
Rim Fire Military.....15&2 %
Cent. Fire, Pistol and Rifle.....25&5&2 %
Cent. Fire, Military and Sporting 15&5&2 %
Blank Cartridges, except 22 and 32 cal., additional 10 % on above discounts.
Blank Cartridges, 22 cal., $1.75.....2 %
Blank Cartridges, 32 cal., $3.50.....2 %
Primed Shells and Bullets.....15&5&2 %
B. B. Caps, Round Ball, $1.75.....2 %
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—

Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....2%

Shells—

First quality, 4, 8, 10 and 12 gauge 25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Star, Club, Rival and Climax brands, 20&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.. 65&2%
I X L, 10 and 12 guage.....40&5&2%
"Special," 16 gauge.....30&10&5&2%
"Special," 10 and 12 gauge.....40&10&2%
Fowler's Pat.....$3.25

Shells Loaded—

Standard. List.....40&10@40&10&10%

Wads—

U. M. C. & W. R. A.—B. E., 11 up..$2.00
U. M. C. & W. R. A.—B. E., 9&10.. 2.30
U. M. C. & W. R. A.—B. E., 7&8.. 2.60
U. M. C. & W. R. A.—P. E., 11 up.. 3.10
U. M. C. & W. R. A.—P. E., 9&10.. 4.00
U. M. C. & W. R. A.—P. E., 7&8.. 4.90
Eley's B. E., 11 up.....$1.75
Eley's P. E., 11@20..... 2.80

Anvils.—

Eagle Anvils, ℔ 10¢.....20@20&5%
Peter Wright's.....9½¢@9¾¢
Armitage's Mouse Hole.....8¾¢
Armitage's Mouse Hole, Extra.11¼@11½¢
Trenton.....9½@9¾¢
Wilkinson's.....9¾@10¢
J. & Riley Carr, Pat. Solid.....11@11½¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%

Apple Parers—

Advance.....℔ doz $4.75
Antrim Combination.....℔ doz 5.50
Baldwin.....℔ doz 5.25
Champion.....℔ doz 7.25
Daisy.....℔ doz 4.00
Eureka, 1888.....each 17.00
Family Bay State.....℔ doz 12.00
Favorite.....℔ doz 5.00
Gem.....℔ doz 5.25
Gold Medal.....℔ doz 4.00
Ideal.....℔ doz 4.00
Improved Bay State.....℔ doz 30.00
Little Star.....℔ doz 4.50
Monarch.....℔ doz 13.50
New Lightning.....℔ doz 5.50
Oriole.....℔ doz 4.00
Penn.....℔ doz 4.00
Perfection.....℔ doz 4.00
Pomona.....℔ doz 4.00
Rocking Table.....℔ doz 6 00
Turntable.....℔ doz 4.50
Victor.....℔doz 13.50
Waverly.....℔ doz 4.00
White Mountain.....℔ doz 4.50
72.....℔ doz 4.25
76.....℔ doz 5.75
78.....℔ doz. 6.50

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co. } 70%
French, Swift & Co. (F. H. Beecher,
Rockford Bit Company.
Cook's, Douglass Mfg. Co.....55 %
Cook's, N. H. Copper Co.50&10@50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ℔ set, 32½ quarters, No. 5, $5; No. 30, $3.50..20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits.....25%
Imitation Jennings' Bits.....60@60&5%
Pugh's Black.....20%
Rockford, Jenning's Pattern.....60%
Car Bits.....50&10@60%
L Hommodieu Car Bits.....15&10%
Forstner Pat. Auge Bits.....10%

Hollow Augers—

Ives' } 33⅓ @
French, Swift & Co. } 33⅓&10%
Douglass'
Bonney's Adjustable, ℔ doz $48....40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....30@30&5%
Cincinnati Standard.....25&10%

Expansive Bits—

Clarks' small, $18; large, $26...35@35&5%
Ives' No. 4, ℔ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common.....℔ gross $2.75@$3.25
Diamond.....℔ doz $1.10.....25&10%
Bee.....25@25&5%
Double Cut, Shepardson's...45@45&10%
Double Cut, Ct. Valley Mfg. Co ...30&10%
Double Cut, Hartwell's, ℔ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood...40&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—

Sewing, Brass Fer. ℔ gr, $3.50.....45&10%
Pat. Sewing, Short.$1.00 ℔ doz,....40&10%
Pat. Sewing, Long.....℔ doz $1.20
Pat. Peg, Plain Top, ℔ gr $10.00...45&10%
Pat. Peg, Leather Top.℔ gr $12.00.45&10%

Awls, Brad Sets, &c—

Awls, Sewing, Common ℔ gr $1.70, 35%
Awls, Should. Peg, ℔ gr $2.45, 40@40&10%
Awls, Pat. Peg...℔ gr 63¢....40@40&10%
Awls, Shouldered Brad..2.70 ℔ gr.....35%
Awls, Handled Brad..$7.50 ℔ gr.....45%
Awls, Handled Scratch ℔ gr, $7.50.35&10%
Awls, Socket Scratch, ℔ doz, $1.50.25@30%

Awl and Tool Sets—

Aiken's Sets, Awls and Tools, No. 20, ℔ doz $10.00.....55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....25@25&10%
Miller's Falls Adj. Tool Hdls.. Nos. 1, $12, 2, $18.....25%
Henry's Combination Haft...℔ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%

Axes—

Makers' and Special Brands—

First quality.....℔ doz $6.00@$6.50
Others.....℔ doz $5.50@$5.75

Axle Grease—

Fraser's.....Keg ℔ ℔ 4¢, Pail ℔ ℔ 5¢
Fraser's, in boxes.....℔ gr $9.50
Dixon's Everlasting, in bxs...℔ doz 1℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting...10-℔ pails, ea. 85¢
Lower grades, special brands, ℔ gr $5.50@$7.00

Axles—

No. 1.....4¢@4¼¢, No. 2 5¼¢@5½¢
Nos. 7 to 14.....55&5%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5):
Less than 10 sets.....33⅓%
Over 10 sets.....33⅓&5%

Bag Holders.—

Sprengle's Pat.....℔ doz $18.....60%

Balances—

Spring Balances.....50%
Common 24-℔.....℔ doz $1.50.....50%
Chatillon's Spring Balances.....50%
Chatillon's Circular Spring Balances.60%

Bells—

Hand—

Light Brass.....70&10 @ 75%
Extra Heavy.....60&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe (Cone's Patent).....25&10@35%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Cow—

Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%
Call.....40@40&5%
Farm Bells.....℔ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60@60&5%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70&10%
Standard.....70&70&5%
Extra.....60&5@60&10%
N. Y. B. & P. Co., Carbon.....60&10&5%
N. Y. B. & P. Co., Diamond.....50&10%

Bench Stops—

Morrill's.....℔ doz $9, 50%
Hotchkiss's.....℔ doz $5, 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's.....℔ doz $3.....10%
Cincinnati.....25&10%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—

Extension,
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60@5@60@10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

Blind Adjusters—

Domestic.....℔ doz $3.00, 33⅓%
Excelsior.....℔ doz $10.00.....50&10&2%
Washburn's Self-Locking....20&20&10%

Blind Fasteners—

Mackrell's, ℔ doz, $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ℔ gr..60&10%
Van Sand's Old Pat., $15.00 ℔ gr..55&10%
Washburn's Old Pattern, ℔ gr.....$9.00
Merriman's.....new list
Austin & Eddy No. 2008, ℔ gr.....$9.00
Security Gravity, ℔ gr.....$9.00

Blind Staples—

Barbed, ½ in. and larger....℔ ℔ 7½¢@8¢
Barbed, ¾ in.....℔ ℔ 8½¢@9¢

Blocks—

Ordinary Tackle, list May 20, 1889...50%
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Bolts—

Door and Shutter—

Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's ..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....55&10%
Wr't Sunk Flush, Stanley's list....50&10%
Wr't B.K.Flush, Com'n " ....55&10%

Carriage, Machine, &c.—

Com. list June 10, '84.....75&7½&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list.....70%
Machine, according to size...75&10@80%
Bolt Ends, according to size..75&10@80%

Tire—

Common, list Feb. 28, '83.....70%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....70%
Phila., list Oct. '84.....82½%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84 ...75&10%
American Screw Company:
Norway, Phil., list Oct. 16, '84....75&10%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....82½&
Bay State, list Feb. 28, '83.....70%
R.B.&W., Philadel., list Oct. 16, '84...82½%

Stove and Plow—

Stove.....65%
Plow.....60&5%
R. B. & W., Plow.....55%

Borax.....℔ ℔ 9½@10½¢

Boring Machines—

	Without Augers.	Upright.	Angular.	
Douglas		$5.50	$6.75	50%
Snell's, Rice's Pat.	5.50	6.75	..40&10&10	
Jennings	5.50	6.75	..45@45&10	
Other Machines	2.35	2.75		net
Phillips' Patent with Augers	00	7.50		

Bow Pins—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co's....$17 and $18.....60&10%
Peck, Stow & W. Co.. 50&10@50&10&5%

Braces.—

Barber's,
Nos. 10 to 16.....50%
Nos. 30 to 33.....50%
Nos. 40 to 63.....50&10%
Barker's,
Nos. 8, 10 and 12.....75&10@80%
Plated, Nos. 8, 10 and 12....65&10@70%
Osgood's Ratchet.....40&10@50%
Spofford's.....50&5@50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Common Ball, American.....$1.00@$1.10
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
P. S. & W.....50&10%

Brackets—

Shelf plain, Sargent's list, 55&10@55&10&10%
Shelf, fancy, Sargent's list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods.....87½

Broilers—

Henis' Self-Basting. } Inch..... 9 10 9x11
} Per doz...$4.50 5.50 6.50

Buckets—See Well Buckets and Pails.

Bull Rings—

Union Co. Nut.....55%
Sargent's.....60%&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70%
Peck, Stow & W. Co's..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Butcher's Cleavers—

Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P. S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Butts—

Brass—

Wrought Brass.....75@75&10%
Cast Brass, Tiebout's.....33⅓%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60&5%
Fast Joint, Broad.....55&10&5@60&10%
Loose Joint. } .70&10
Loose Joint, Japanned. } @75%
Loose Joint, Jap. with Acorns. }
Parliament Butts. }
Mayer's Hinges.....30%
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.....

Wrought Steel—

Fast Joint, Narrow. } .70&10
Fast Joint, Lt. Narrow. } @75%
Fast Joint, Broad. }
Loose Joint, Broad. }
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Inside Blind, Light.....
Loose Pin.....
Bronzed Wrought Butts.....50%

Calipers—

See Compasses.

Calks, Toe—

Gautier.....℔ ℔ 5½¢@6¢
Dewicks (Burke).....℔ ℔ 5½¢@6¢

Can Openers—

Messenger's Comet.....℔ doz $3.00, 25%
American.....℔ gross $3.00
Duplex.....doz 25¢, 15@20%
Lyman's.....℔ doz $3.75, 20%
No. 4 French.....℔ doz $2.25, 55@60%
No. 5, Iron Handle.....℔ gr $6.00, 45@50%
Eureka.....℔ doz $2.50, 10%
Sardine Scissors.....℔ doz $2.75@3.00
Star.....℔ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50 50&10&10%
World's Best, ℔ gross, No. 1, $12.00 No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ℔ doz $3.00.....35&5%
Domestic, ℔ doz $2.50.....45%
Champion ℔ doz $2.00.....50

Cards—
Horse & Curry.....10&10@10&10&10%
Cotton.....10@10&10%
Wool.....10@10&10%

Carpet Stretchers—
Cast Steel, Polished.....₱ doz $2.25
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Bullard's.....25@25&10%

Carpet Sweepers—
Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.₱ doz $19.00
Bissell, Grand.....₱ doz $36.00
Grand Rapids.....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20,00
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Improved Parlor Queen,
Nickeled.....₱ doz $27.00
Japanned.....₱ doz $24.00
Excelsior.....₱ doz $22.00
Garland.....₱ doz $18.00
arlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed, Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog-Wheel.....₱ doz $16.00
Conqueror.....₱ doz $22.00
Easy.....₱ doz $22.00
Monarch.....₱ doz $22.00
Goshen.....₱ doz $21.00
Advance.....₱ doz $18.00
Ladies' Friend, No. 1, ₱ doz, $15.00;
No. 2.....₱ doz $16.00
American.....₱ doz $15.00
Grand Republic.....₱ doz $35.00

Cartridges—
See Ammunition.

Casters—
Bed.... } Brass....55@55&10%
Plate... } Others...60@60&10%
Shallow Socket....
Deep Socket.....40&10%
Yale Casters, list May, 1884...30&10&40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10&50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—
Humason, Beckley & Co.'s.....70%
Sargent's.....66⅔&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....50&10%

Chain—
Trace, 6½-10-2, exact,
₱ pair, $1.03.....50&10@50&10&5%
Trace, 6½-10-3, exact,
₱ pair 92¢.....50&10@50&10&5%
Trace, 7-10-2, exact,
₱ pair $1.11.....50&10@50&10&5%
NOTE.—Traces, "Regular" sizes, 3¢ per ₱ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, List Nov. 1, 1884
50&10@50&10&5%
American Coil, in cask lots,
3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾
$8.25 5.75 5.00 4.00 3.70 3.60 3.50 3.40
Less than cask lots, add ½¢@½¢ ₱ ℔.
German Coil, list of June 20, 1887
50&10&5@60%
German Halter Chain, list of June 20, 1887.....50&10&5@60%
Covert Halter.....60&2%
Covert Traces.....35@2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₱ ℔ 5½@5½¢
Jack Chain, Iron.....75@75&5%
Jack Chain, Brass.....70@70&5%

Chalk—
White.....₱ gr 50¢
Red.....₱ gr 70¢
Blue.....₱ gr 85¢
See also Crayons.

Chalk Lines—
See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W. } 75&10 @ 75&
New Haven } 10&5%
Witherby }
Mix }
Ohio Tool Co. }
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....30@30&5%
Tanged and Miscellaneous.
Tanged Firmers.....40&10@a50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to £
Buck Bros.....30%
Cold Chisels, ₱ ℔.....10@19¢

Chucks—
Beach Pat.....each, $8.00.....20%
Morse's Adjustable,each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Balz Pat.....25%
Skinner's Pat. Drill Chucks.....30%
Skinner's Independent Lathe Chucks.40%
Skinner's Pat. Comb. Chuck.....40%

Clamps—
R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Gray's.....20%
Adjustable, Lambert's.....20%
Adjustable, Snow's.....40&5%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....20&10%
Stearn's Adjustable Cabinet and Corner.....20&10%
Cabinet, Sargent's.....66⅔&10%
Carriage Makers', Sargent's.....50&10%
Eberhard Mfg. Co.....40&5&40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises.

Clips—
Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16 65&5%
Superior Axle Clips.....66⅔&5@70%
Norway Spring Bar Clips, 5-16...60&5&5%
Wrought Iron Felloe Clips.....₱ ℔, 5½¢
Steel Felloe Clips.....₱ ℔, 5¢
Baker Axle Clips.....25%

Cockeyes.....50%

Cocks, Brass.
Hardware list.....50&2%

Coffee Mills—
Box and Side, List Jan. 1, 1888.....60&2%
American, Enterprise Mfg Co.20&10&30%
The Swift, Lane Bros.....20&10%

Compasses Dividers, &c—
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers 25&10&10%
Lock Calipers and Dividers.....25&10%
Combination Dividers.....25&10%

Coopers' Tools—
Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Alberson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%

Corkscrews—
Humason & Beckley Mfg. Co..40@40&10%
Clough's Pat.....33⅓@33⅓&5%
Howe Bros & Hulbert.....35%

Cork Knives and Cutters—
Bradley's.....10%
Wadsworth's.....25%

Cradles—
Grain.....50&5&2 @ 50&10&2%

Crayons.
White Crayons, ₱ gr 12¢@12½¢.....10%
D. M. Stewart Mfg. Co., Metal Workers, ₱ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₱ gr, $2.50.....25%
See also Chalk.

Crow Bars—
Cast Steel.....₱ ℔ 4¢
Iron, Steel Points.....₱ ℔ 3½¢

Curry Combs—
Fitch's.....50&10@50&10&10%
Rubber per doz $10.00.....20%
Perfect.....50%

Curtain Pins—
Silvered Glass.....net
White Enamel.....net

Cutlery—
Beaver Falls & Booth's.....33⅓
Wostenholme.....$7.75 to £

Dampers, &c—
Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Dividers—
See Compasses.

Dog Collars—
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%

Door Springs—
Torrey's Rod, regular size....₱ doz $1.30
Gray's, ₱ gr., $20.00.....20%
Bee Rod ₱ gr., $20.00.....20%
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30.....40&10@50%
Gem (Coil), list April 19, 1886.....10%
Star (Coil), list April 19, 1886.....20%
Victor (Coil).....60@60&10%
Champion (Coil).....60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75.. "
Cowell's....No. 1, ₱ doz, $18.00; No. 2, $15.00.....50%
Rubber, complete, ₱ doz, $4.50...55&10%
Hercules.....50%
Shaw Door Check and Spring.25@30@35%

Drawing Knives—
Witherby.. } 75&10@ 75&10
P. S. & W. } &5%
Mix }
New Haven }
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Drills and Drill Stocks—
Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's.....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5%
Ratchet, Whitney's.....20&10%
Ratchet, Weston's.....20@25%
Ratchet, Moore's Triple Action....25@30%
Ratchet, Curtis & Curtis.....30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools... $1.75@$1.85

Twist Drills—
Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans—
Smallsizes,.....₱ ℔ 6¾¢
Large sizes.....₱ ℔ 6¼¢

Egg Beaters.
Dover.....₱ doz $1.50
National, ₱ doz $4.50.....33⅓%
Family (T. & S. Mfg. Co.), ₱ gro $17.00@$18.00
Duplex (Standard Co.).....₱ gro $15.00
Rival (Standard Co.).....₱ gro $12.00
Large Duplex (Standard Co.), ₱ doz $4.50
Triumph (T. & S. Mfg. Co.), ₱ gro $10.50@$11.50
Advance, No. 1.....₱ gro $10.50
Advance, No. 2.....₱ gro $10.00
Bryant's.....₱ gro $14.00
Ayres' Spiral.....₱ gro $5.00
Double (H. & R. Mfg. Co).....₱ gro $16.20
Easy (H. & R. Mfg. Co.).....₱ gro $14.00
Triple (H. & R. Mfg. Co.).....₱ gro $16.20
Spiral (H. & R. Mfg. Co.).....₱ gro $4.50
Paine, Diehl & Co.'s.....₱ gro $24.00

Egg Poachers—
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00.....25%

Electric Bell Sets.—
Wollensak's.....20%
Bigelow & Dowse.....20%

Emery— No. 4 to 46 gr. | No. 54 to 150 gr. | Flour, CF FF.
Kegs, ₱ ℔.....4½¢ | 5 ¢ | 2½¢
½ kegs, ₱ ℔.....4¾¢ | 5½¢ | 2¾¢
¼ kegs, ₱ ℔.....5 ¢ | 5½¢ | 3 ¢
10-℔ cans, 10 in case.....6 ¢ | 6½¢ | 5 ¢
10-℔ cans, less than 10.....10 ¢ | 10 ¢ | 7½¢

Enameled and Tinned Ware—
See Hollow-Ware.

Escutcheon Pins—
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Escutcheons.
Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Faucets.—
Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..40%
Metallic Key, Leather Lined....60&10&60&10&10%
Cork Lined.....70&5&70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₱ doz $50.00.....20&10%
Lane's, ₱ doz $36.00.....25&10%
Victor, ₱ doz $36.00.....25 &10%

Felloe Plates.....₱ ℔ 6@6½¢

Fifth Wheels.—
Derby and Cincinnati.....50&5%
Brewster.....55&5%

Files—
Domestic—
Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
Other makers, best brands 60&10@60&10&10%
Fair brands.....60&10&10@70%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60& 10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%
Imported—
J. & Riley Carr....List, April 1, 1883, 15%
J. & Riley Carr Horse Rasps.....10%
Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 25%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fluting Machines—
Knox, 4¼-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Roll, $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in. $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10,00.....30%
Shepard Hand Fluter, No. 85 ₱ doz $15.30.....40%
Shepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter, ₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30%
Buffalo.....₱ doz $10.00.....10%

Fluting Scissors.....45%

Fodder Squeezers—
Blair's.....₱ doz $2.00
Blair's "Climax".....₱ doz $1.25

Forks—
Hay, Manure, &c., Asso. List.....70%
Hay, Manure, &c., Phila. List 60@60&5%
Plated, see Spoons.

Freezers, Ice Cream—
Buffalo Champion.....65&65&5%
Shepard's Lightning.....65 @ 65&5%
White Mountain.....50&20&5%
New Arctic.....50&40&5%
American.....60%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless and Giant.....60&10
Zero and Pet.....65&10
Boss.....65&10&10
Keystone, each, $1.50.....25%

Fruit and Jelly Presses—
Enterprise Mfg. Co.....20&10&30%
Henlis.....₱ doz $2.50
Shepard's Queen City.....40%

Fry Pans—
High List.....75&10@75&10&5%
No..... 0 1 2 3 4
₱ doz..$3.75 $4.70 $5.30 $5.95 $6.55
No..... 5 6 7 8
₱ doz.....$7.50 $8.75 $10.00 $11.25
Low List.....70 @ 70&10%
No..... 0 1 2 3 4
₱ doz..$3.00 $3.75 $4.25 $4.75 $5.25
No..... 5 6 7 8
₱ doz.....$6.00 $7.00 $8.00 $9.00

Fuse— ₱ 1000 ft
Common Hemp Fuse,for dry ground.$2.70
Common Cotton Fuse,for dry ground 2.85
Single Taped Fuse, for wet ground.. 4.25
Double Taped Fuse, for very wet gr. 5.40
Triple Taped Fuse, for very wet gr.. 6.50
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gauges—
Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch, 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....50@50&5%
Wire, Brown & Sharpe's.....10@20%

Gimlets—
Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₱ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₱ gr $12.....25@25&5%

Glue—
Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process 25@25&5%

Glue Pots—
Tinned.....40%
Enameled.....40&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Grindstones—
Small, at factory.....₱ ton $7.50@9.00

Grindstone Fixtures—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%

Hack Saws.—
See Saws.

Halters—
Covert's, Rope, ½-in. Jute.....50&2%
Covert's, Rope, ½-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%

Hammers—
Handled Hammers—
Maydole's, list Dec. 1, '85..... 25&10@35%
Buffalo Hammer Co.... } List Jan. 15, '87
Humason & Beckley... } 50@50&10%
Atha Tool Co..... }
Fayette R. Plumb.....40&10@50%
C. Hammond & Son.....40&10@50%
Verree.....5%
Magnetic Tack, Nos. 1, 2, 3, ₱1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
3 ℔ and under..... ₱ ℔ 40¢ } 60&10
3 to 5 ℔.....₱ ℔ 36¢ } &10 @ 70%
Over 5 ℔.....₱ ℔ 30¢ }
Wilkinson's Smiths.....10½¢@11¢ ₱ ℔

Handcuffs and Leg Irons—
R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00.....2 5

Handles—
Iron, Wrought or Cast—
Door or Thumb.
Nos..... 0 1 2 3 4
Per doz....$0.90 1.00 1.18 1.35 1.50
60&10&10%
Roggin's Latches.....₱ doz 30¢@35¢
Bronze Iron Drop Latches..₱ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62;
Plate, $1.10; no Plate, $0.88.....net
Barn Door, ₱ doz $1.40.....10&10%
Chest and Lifting.....70%
Handles, Wood—
Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₱ gr $2.00
Hickory Firmer Chisel, ass'd. ₱ gr 4.50
Hickory Firmer Chisel, large. ₱ gr 5.00
Apple Firmer Chisel, ass'd...₱ gr 5.00
Apple Firmer Chisel, large...₱ gr 6.00
Socket Firmer Chisel, ass'd..₱ gr 3.00
Socket Framing Chisel, ass'd. ₱ gr 5.00
J. S. Smith & Co.'s Pat File.....50%
File, assorted.....₱ gr 2.75 } 40@
Auger, assorted.....₱ gr 5.00 } 40&10%
Auger, large.....₱ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass'.....₱ set $1.25
Pat. Auger, Swan's.....₱ set $1.00
Hoe, Rake, Shovel, &c.....50&10%

Cross-Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 28¢; No. 3, 18¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Boynton's Loop Saw Handles, 50¢... 60%
Champion.....15¢

Hangers—
Barn Door, old patterns...60&10&10&70%
Barn Door, New England..60&10&10&70%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....60%
limax Anti-Friction for Wood Track.55%
Zenith for Wood Track..... ... 55%
ed's Steel Arm.....50%
allenge, Barn Door 50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00 ..... 50&2%
Cheritree.....50&10%
Kidder's.....50&10&60%
The Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₱ doz pr. 4 in, $10.00; 5 in. $12.00.....50&5c&50&10%
Cronk's Pat., No. 4, $12.00; No. 5, $14.40; No. 6, $18.00.....50&15c&60%
Wood Track Iron Clad, ₱ ft. 10¢.....50 &15c&60%
Carrier Steel Anti-Friction.....50c&50&5%
Architect, ₱ set $6.00.....20%
Eclipse.....20&10%
Felix, ₱ set $4.50.....20%
Richards'.....30c&30&10%
Lane's Steel Anti-Friction.....50%
Ball Bearing Door Hanger..20&10c&25&10%
Warner's Pat.....20c&20&10%
Stearns' Anti-Friction.....20c&20&10%
Stearns' Challenge.....25&10c&25&10&10%
Faultless.....40c&40&5%
American, ₱ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5½, 7 and 8.....20&10%
Crescent.....60&60&10%
Nickel, Cast Iron.....50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap..33⅓%
Scranton Anti-Friction Double Strap..40%
Universal Anti-Friction.....40%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10c&40&10&5%
May.....50&5c&50&10%
Barry, $6.00.....40&10%

Harness Snaps—
See Snaps.

Hatchets—
List Jan. 1, 1886.
Isaiah Blood.....35@40%
Hunt's Shingling, Lath and Claw..40&5%
Hunt's Broad.....40%
Buffalo Hammer Co.....40&10c&50%
Hurd's.....40&10c&50%
Fayette R. Plumb.....40&10c&50%
Wm. Mann, Jr., & Co.....50c&50&5%
Underhill Edge Tool Co.....40&5c&40&10%
Underhill's, Haines and Bright.... 33⅓%
C. Hammond & Son.....40&10c&50%
Simmons'.....40&10c&50%
Peck's.....40&10c&40&10&5%
Kelly's.....50c&50&5%
Sargent & Co.....50%
Ten Eyck Edge Tool Co.40&10c&40&10&5%
Collins.....40%
Schulte, Lohoff & Co.....50@50&5%

Hay and Straw Knives—
Lightning...Mfrs'. price ₱ doz $18.00, 25%
But jobbers cut this price freely.
Gem.....₱ doz $10
Wadsworth's.....40&7½c&40&10%
Carter's Needle.....₱ doz $11.50@$12.00
Heath's.....₱ doz $13.50&14.00
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay.....₱ doz $10.00

Hinges—
Wrought Iron Hinges
Strap and T.....75&5@75&10%
Screw Hook and Strap: 6 to 12 in., ₱ lb ..4¢; 14 to 20 in., ₱ lb.. 3½¢; 22 to 36 in., ₱ lb ..3¢
Heavy Welded Hook: 6 to 12 in., ₱ lb....4¢; 14 to 20 in., ₱ lb.. 3½¢; 22 to 36 in., ₱ lb ..3¢
Screw Hook and Eye: ½ in., ₱ doz $1.50; ⅝ in., ₱ doz $2.45; ¾ in., ₱ doz $3.80 — 10%
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges (8, 10 & 12 in., ₱ lb.....5¢
"Providence" over 12 in., ₱ lb. ...4¢
Spring Hinges—
Geer's Spring and Blank Butts.....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem, and Star.....20%
Oxford.....20%
Barker's Double Acting.....20&10%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Gate Hinges—
Western.....₱ doz $4.40, 60%
N. E.....₱ doz $7.00, 55%
N. E. Reversible.....₱ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₱ doz $5.00, 55&10%
Automatic.....₱ doz $14.50, 50%
Common Sense.....₱ doz pair $4.50, 50%
Seymour's.....45&10%
Shepard's.....60&10&5%
Reed's Latch and Hinges. ₱ doz $12.00, 50%
Blind Hinges—
Parker.....75&2%
Palmer.....50&5&10%
Seymour.....70&2%
Nicholson.....45&10%
Hyffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5@80%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 13 75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10&5%
Niagara.....80&2½%
Buffalo.....80&5%
Clark's Genuine Pat.....80&5%
O. S., Lull & Porter.....75&10@80%
Acme, Lull & Porter.....75&5%
Queen City Reversible.....75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50. .....25&2%

Hoes—
Handled—
Garden, Mortar, &c.....70%
Planter's, Cotton, &c.....70%
Warren Hoe.....60%
Magic.....₱ doz $4.00
Eye—
D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern ..30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat..60&5@60&10%
Hubbard & Co., S. & O. Pat.60&5@60&10%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60@60&10%

Hog Rings and Ringers—
Hill's Improved Ringers.....₱ doz $4.25
Hill's Old Style Ringers.....₱ doz $2.75
Hill's Tongs.....₱ doz $4.50
Hill's Rings.....₱ doz bxs $2.15@2.25
Perfect Rings.....₱ doz bxs $1.60@1.70
Perfect Ringers.....₱ doz $2.15@$2.25
Blair's Hog Ringers.....₱ doz $2.25@2.50
Blair's Hog Rings.....₱ doz 90¢@$1.00
Champion Ringers.....₱ doz $2.00
Champion Rings, Double.....₱ doz $2.25
Brown's Ringers.....₱ doz $2.00
Brown's Rings.....₱ doz $1.25@1.30

Hoisting Apparatus—
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Differential Pulley Block...40%
Energy Mfg. Co's.....25%

Holders, File and Tool—
Balz Pat.....₱ doz $4.00; 25%
Nicholson File Holders.....20%

Hollow-Ware—
Iron—
Stove Hollow-Ware—
Ground.....60@60&5%
Unground.....60&10c&60&10&10%
Boilers and Saucepans.....40&5%
Tinned Boilers and Saucepans.....40%
Gray Enameled-Ware—
Stove.....45&50%
Maslin Kettles.....60&10c&60&10&10%
Boilers and Saucepans.....40&5%
Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Rustless Hollow-Ware.....50@50&5%
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Silver Plated—
4 mo. or 5 % cash in 30 days.
Reed & Barton.....
Meriden Britannia Co.....
Simpson, Hall, Miller & Co..... — 40&5%
Rogers & Brother.....
Hartford Silver Plate Co..... — 40&5%
William Rogers Mfg. Co.....

Hooks—
Cast Iron—
Bird Cage, Sargent's list.....
Bird Cage, Reading..... — 60&10&10%
Clothes Line, Sargent's list..
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list ..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10&60&10%
Coat and Hat, Reading .50&10@50&10&10%
Wrought Iron—
Cotton.....₱ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)..50%
Wrought Staples, Hooks, &c. See Wrought Goods.
Wire—
Wire Coat and Hat, Gem, list April, 1886.....50%
Wire Coat and Hat, Miles', list April, 1886.....50%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....45%
Belt.....80&80&10%
Miscellaneous.
Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₱ doz $2.25
Bush.....55&60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70&70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks.....See Bench Stops.

Horse Nails—

Nos.	6	7	8	9	10
Ausable.....	28¢	26¢	25¢	24¢	23¢.

25&10@25&10&10%
Clinton, Fin.. .....10½ @ 11¢, net
Essex .....28¢ 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Lyra..... .....25¢ 23¢ 22¢ 21¢ 20¢. 40&10&5@50%
Snowden .....25¢ 23¢ 22¢ 21¢ 20¢. 40&10&5@50%
Putnam.....23¢21¢ 20¢ 19¢ 18¢. 1000 ℔ in year 15%
Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢..12½&5%
Northwest'n.25¢ 23¢ 22¢ 21¢ 20¢. 10&10&5&5%
Globe .....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
Boston.....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
A. C.....25¢ 23¢ 22¢ 21¢ 20¢. 25&10@33⅓&5%
C. B.-K.....25¢ 23¢ 22¢ 21¢ 20¢. 25¢10@33⅓&5%
Champlain .28¢ 6¢ 25¢ 24¢ 23¢. 25&10&10%
New Haven..28¢ 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Saranac.....23¢ 21¢ 20¢ 19¢ 18¢...30&10%
Champion ...25¢ 23¢ 22¢ 21¢ 20¢. 10&10&10%
Capewell.....28¢ 26¢ 25¢ 24¢ 23¢. 35&5@35&10%
Star.....23¢ 21¢ 20¢ 19¢ 18¢. 10&10&10&12½%
Anchor.....23¢ 21¢ 20¢ 19¢ 18¢.....35%
Western.....23¢ 21¢ 20¢ 19¢ 18¢...40&10%
Empire Bronzed. .....14 ₱ lb.

Horse Shoes—See Shoes Horse.

Hose, Rubber—
Competition..... ...75&10@75&10&5%
Standard..... .....70@70&10%
Extra.....66@60&10%
N. Y. B. & P. Co., Para.....30&10%
N. Y. B. & P. Co., Extra.....50%
N. Y. B. & P. Co., Dundee.....60&10&5%

Huskers—
Blair's Adjustable.....₱ gr $8.00
Blair's Adjustable Clipper.....₱ gr 7.00

Indurated Fiber-Ware—25%.
Spittoons, No. 2, ₱ doz.....$9.00
Basins, Ringed, ₱ doz., No. 1, $4.80; No. 2, $4.20; No. 3.....$3.60
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest.....$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest.....$3.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ₱ nest.....$2.25
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces) ₱ set.....$4.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ₱ set.....$5 00
See also *Pails.*

Jack Screws—See Screws.

Kettles—

	Spun.	Stamped.
Brass, 7 to 17 in., ₱ lb.....	24¢	21 ¢
Brass larger than 17 in., ₱ lb.....	26¢	23½¢

Enameled and Tea Kettles. See *Hollow-Ware.*

Keys—
Lock Asso'n list Dec. 30, 1886...50&10@60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₱ doz $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—
Parkin's.
Applewood Handles...₱ doz $6.00, 40%
Rosewood or Cocobolo. ₱ doz $9.00, 40%

Knives—
Wilson's Butcher Knives.....25@30%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Nichols' Butcher Knives.....40&10%
Ames' Shoe Knives.....20@25%
Ames' Bread Knives. ₱ doz $1.50, 15@20%
Moran's Shoe and Bread.....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent.....$3.50

Knobs—
Door Mineral.....65@68%
Door Por. Jap'd.....75@78%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60@10&40&10&10%
Hemacite Door Knobs.....40&10c&50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....90&10&10&70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₱ gro 80¢, 60&10%

Ladles—
Melting, Sargent's.....55&10%
Melting, Reading .....35&10%
Melting, Monroe's Pat...₱ doz $4.00, 40%
Melting, P. S. & W.....35&10&40%
Melting, Warner's.....30%

Lanterns—
Tubular—
Plain with Guards, ₱ doz.....$4.00@4.25
Lift Wire, with Guards.....$4.50@4.75
Square Plain, with Guards.....$4.00@4.25
Sq. Lift Wire, with Guards...$4.25@4.50
Without Guards, 25¢ ₱ doz less.
Miscellaneous.
Police, Small, $6.00; Medium, $7.25; Large, $9.75.....20@25%

Lawn Mowers—
Standard List.....50&10%
Quaker City.....60&10%
Enterprise.....60&10%

Lemon Squeezers—
Porcelain Lined, No. 1....₱ doz $6.00, 25&20%
Wood, No. 2.....₱ doz $3.00, 35%
Wood, Common.....₱ doz $1.70@1.75
Dunlap's Improved .....₱ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz.....25&10%
Jennings' Star.....₱ doz $2.50
The Boss.....₱ doz $2.50
Dean's...Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90
Little Giant.....50@50&5%
King.....40&5%

Lines—
Cotton and Linen Fish, Draper's.....50%
Draper's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson, Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton.....45%
White Clothes.. Nos. 18 19 20
$3 60 $3.00 $2.5

Ventilator Cord, Samson Braided, White or Drab Cotton..₱ doz $7.50, 20%

Locks, &c.—
Door Locks, Latches, &c.
R. & E. Mfg. Co., list Mar. 20, 1889.....
Mallory, Wheeler & Co., list July, '88..... — 60&10@60 &10&10%
Sargent & Co., list Aug. 1, '88
Reading Hardware Co., list Feb. 2, '88.....
Note.—Lower net prices often made.
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
F. Many's "Extension Cylinder" $10.50 ₱ doz.
Barnes Mfg. Co.....40&10&10%
Yale.....net prices
Deitz Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Shepardson or U. S.....35%
Felter or American.....40&10%
Seed's N. Y. Hasp Lock.....25%
Cabinet—
Eagle, Gaylord Parker and Corbin... } List March, '84, Jan. 1, '85..33⅓&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 86 to 96.....30%
Stoddard Lock Co.....30&33⅓&%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40&40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin...33⅓&%
Yale.....net prices
Romer's.....25%
Padlocks—
List Dec. 23, '84.....75@75&10%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deitz.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₱ doz, $9. 40&40&10%
Barnes Mfg. Co.....40&40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90@90&10%
E. T. Fraim's Keystone Scandavian: Nos 119, 120, 130 and 140.....90&10% Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%

Lumber Tools.

Ring Peavies, "Blue Line"...₱ doz $20.00
Ring Peavies, Common.....₱ doz $18.00
Steel Socket Peavies.....₱ doz $21.00
Mall. Iron Socket Peavies....₱ doz $19.00
Cant Hooks, "Blue Line"...₱ doz $16.00
Cant Hooks, Common Finish..₱ doz$14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₱ doz $12.00
Hand Spikes....₱ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₱ doz $18.00

Lustro—
Four-ounce Bottles....₱ doz, $1.75; ₱ gross.....$17.00

Mallets—
Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

Match Safes—
Dangerfield's Self-Igniting...₱ doz $1.5

Mattocks. Regular list.....60@60&10%

Meat Cutters—
Dixon's ₱ doz.....40&5%

Nos.....	1	2	3
	$14.00	$17.00	$0.00

Woodruff's ₱ Joz.....40&5%

Nos..		100	150
		$15.00	$18.00

Champion ₱ doz .....40&45%

Nos.....	200	300	400
	$22.00	$27.00	$40.00

Hales Pattern ₱ doz..... 70@70&5%

Nos.....	11	12	13
	$27.00	$33.00	$45.00

American..... .....30%

Nos.....	1	2	3	4	B	5
Each.....	$5	$7	$10	$25	$50	$60

Enterprise.....30%

Nos..	10	12	22	32	42
Each.....	$3	$2.50	$4	$6	$15

Pennsylvania..... .....40&10%

Nos.....	1	2	3	00
₱ doz...	$24.00	$28.00	$36.00	$28.00

Miles' Challenge ₱ doz .....45@45&10%

Nos.....	1	2	3
	$22.00	$30.00	$40.00

Home No. 1.....₱ doz, $26.00, 55&10%
Draw Cut, each:

Nos..5	2	6	8
$50	$75	$80	$225

.....20@25%
Beef Shavers (Enterprise).....20&10@30%
Chadborn's Smoked Beef Cutter. ₱ doz $66.00

Mincing Knives—
Am. (2d quality, ₱ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₱ doz, Single, $2.00; Double, $3 40@45%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable.....₱ doz. $3.00 25%

Molasses Gates—

Stebbin's Pat. ..... 70@70&7½%
Stebbin's Genuine ..... 60&10&10%
Stebbin's Tinned Ends ..... 40&10%
Chase's Hard Metal ..... 50&10%
Bush's 20%
Lincoln's Pattern. ..... 70@70&10
Weed's. ..... 20&10%

Boss, ₱ doz:
Nos. 1, $7; No. 2, $8; No. 3, $9; No. 4 $10 ..... 60&10&10%

Money Drawers....₱ doz, $18@$20

Muzzles—

Safety ..... ₱ doz, $3.00, 25 %

Nails, see Trade Report.

Wire Nails, Papered.
Association list, July 15, 1889. 70&10&10@70&10&10&5%
Tack Mfrs.' list ..... 70@70&5%
Wire Nails, Standard Penny.
Card June 1, '89, base ..... $2.40@$2.50

Nail Puller—

Curtiss Hammer ..... ₱ doz $9.00
Giant, No. 1 ..... ₱ doz. $30.00, 10%
Pelican ..... ₱ doz, $9.00, 25%
Boss ..... ₱ doz, $30.00, 30%
Lightning ..... ₱ doz $21.00

Nail Sets—

Square ..... ₱ gr., $4.00@$4.25
Round ..... ₱ gr. $3.25
Cannon's Diamond Point...₱ gr., $12, 20%

Nut Crackers—

Table (H. & B. Mfg. Co.) 40%
Blake's Pattern ..... ₱ doz $2.00, 10%
Turner & Seymour Mfg. Co... ..... 50%

Nuts—

Nuts, off list Jan. 1, 1888:

	Square.	Hex.
Hot Pressed	5.4¢	5.9¢
Cold Punched	5.4¢	5.5¢

In lots less than 100 ℔, ₱ ℔, add ½¢; 1-℔ boxes, add 1¢ to list.

Oakum—

Government ..... ₱ ℔ 7½@7¾¢
U. S. Navy ..... ₱ ℔ 6¾@6¾¢
Navy ..... ₱ ℔ 5½@5¾¢

Oilers—

Zinc and Tin ..... 65@65&10%
Brass and Copper ..... 50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&10%
Malleable, Hammers, Old Pattern, same list 40%
Prior's Pat. or "Paragon" Zinc, 60@10&10%
Prior's Pat. or "Paragon" Brass 50%
Olmstead's Tin and Zinc 60%
Olmstead's Brass and Copper 50%
Broughton's Zinc 60%
Broughton's Brass 50%
Gem P. D. & Co. ..... ₱ gro. $2

Packing, Steam—
Rubber—

Standard ..... 60&10@60&10&10%
Extra ..... 50&10@60%
N. Y. B. & P. Co., Standard ... 50&10&5%
N. Y. B. & P. Co., Empire 70%
N. Y. B. & P. Co., Salamander. ₱ ℔ 65¢, 30%
Jenkins' Standard ..... ₱ ℔ 80¢, 35%

Miscellaneous—

American Packing ..... 10¢@11¢ ₱ ℔
Russia Packing ..... 14¢ ₱ ℔
Italian Packing ..... 13¢@14¢ ₱ ℔
Cotton Packing ..... 15¢@17¢ ₱ ℔
Jute ..... 7¢@8¢ ₱ ℔

Padlocks—

See Locks.

Pails—

Galvanized Iron—

Quarts	10	12	14
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₱ dz.	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Sidney Shephard & Co.	2.80	3.00	3.40
Iron Clad	2.75	3.00	3.25
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.

Indurated Fibre Ware—25%
Star Pails, 12 qt ..... ₱ doz $6.00
Fire, Stable and Milk, 14 qt .. ₱ doz $7.80

Standard Fibre Ware—

	Plain.	Deer'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	

Pencils—

Faber's Carpenters' ..... high list 50%
Faber's Round Gilt ..... ₱ gro $5.25
Dixon's Lead ..... ₱ gro $4.50
Dixon's Lumber ..... ₱ gro $6.75
Dixon's Carpenters' ..... 40&10%

Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00 ..... 60 @ 60&10%

Picture Nails—

Brass Head, Sargent's list ..... 50&10&10%
Brass Head, Combination list ..... 50&10%
Porcelain Head, Sargent's list. 50&10&10%
Porcelain Head, Combination list. 40&10%
Niles' Patent 40%

Pinking Irons— ₱ doz 65¢ net

Pipe, Wrought Iron—

List September 18, 1889.

1¼ and under, Plain 50%
1¼ and under, Galvanized 42½%
1½ and over, Plain 62½%
1½ and over, Galvanized 50%
Boiler Tubes, Iron.
1¾ and under 50%
2 in. and larger 55%

Planes and Plane Irons—

Wood Planes—

Molding ..... 50&10@60%
Bench, First Quality ..... 60@60&5%
Bench, Second Quality ..... 60&10&10@70%
Bailey's (Stanley R. & L. Co.) ..... 40&10%

Iron Planes—

Bailey's (Stanley R. & L. Co.) ..... 40@10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 20&10%
Victor Planes (Stanley R. & L. Co.). 20&10%
Steer's Iron Planes ..... 35@35&5%
Meriden Mal. Iron Co.'s. 30&10@30&10&10%
Davis's Iron Planes ..30&10@30&10&10%
Birmingham Plane Co. ..... 50@50&5%
Gage Tool Co.'s Self-Setting ..... 20&10%
Chaplin's Iron Planes ..... 40@40&5%
Sargent's ..... 30&10@30&10&10%

Plane Irons—

Plane Irons ..... 20&10%
Plane Irons, Butcher's...$5.00@$5.25 to £
Plane Irons, Buck Bros 30%
Plane Irons, Auburn Tool Co., "Thistle" 40%
Sandusky Tool Co.:
Single and Cut 30%
Double 40%
L. & I. J. White 25%

Pliers and Nippers—

Button's Patent ..... 30&10@40%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz ..... 20&10@33½%
Humason & Beckley Mfg. Co. .50@50&10%
Gas Pliers 60%
Gas Pliers, Custar's Nickel Plated. 60&5%
Eureka Pliers and Nippers 40%
Russell's Parallel 25%
P. S. & W. Cast Steel 50%
P. S. & W. Tinners' Cutting Nippers, add 6% dis 10%
Carew's Pat. Wire Cutters 30%
Morrill's Parallel, ₱ doz, $12.00 ..30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—

Regular List ..... 70&10@70&10&10%
Disston's ..... 45&10%
Pocket Levels ..... 70&10@70&10&10%
Davis Iron Levels 30%
Davis' Inclinometers ..... 10&10%

Polish, Metal.

Prestoline ..... 20&10%
Prestoline Paste 33⅓%
Gaston's Silver Compound 33⅓%

Pokes, Animal—

Bishop's I. X. L. ..... ₱ doz $6.50
Bishop's O. K. ..... ₱ doz $5.50
Bishop's Pioneer ..... ₱ doz $3.75
Bishop's American ..... ₱ doz $3.00

Poppers, Corn—

Round or Square, 1 qt.. ₱ gr $12.00@15.00
Round or Square, 2 qt.. ₱ gr $25.00@26.00

Post Hole and Tree Augers and Diggers—

Samson Post Hole Digger, ₱ doz $36.00. 25&10%
Fletcher Post Hole Augers, ₱ doz $36, 20%
Eureka Diggers ..... ₱ doz $16.00@17.00
Leed's ..... ₱ doz $8.00@9.00
Vaughan's Post Hole Auger, ₱ doz $13.00@14.00
Kohler's Little Giant ..... ₱ doz $18.00
Kohler's Hercules ..... ₱ doz $15.00
Kohler's New Champion ..... ₱ doz $9.00
Schneidler ..... ₱ doz $18.00
Ryan's Post Hole Digger ..... ₱ doz $24.00
Cronk's Post Bars, ₱ doz $60.00, 50&5&50&10%
Gibbs Post Hole Digger, ₱ doz $30.00, 50%
Imperial, ₱ doz, $15 ..... 45%

Potato Parers—

White Mountain ..... ₱ doz $5.00@5.50
Antrim Combination ..... ₱ doz $8.00
Hoosier ..... ₱ doz $13.50

Pruning Hooks and Shears—

Disston's Combined Pruning Hook and Saw ..... ₱ doz $18.00, 20&10%
Disston's Pruning Hook, ₱ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools 40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00 net
Henry's Pruning Shears, ₱ doz $4.25@4.50 net
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2, 7.25

Pulleys—

Hot House, Awning, &c. ..... 60&10%
Japanned Screw ..... 60&10%
Brass Screw ..... 60&10%
Japanned Side ..... 66⅔&10%
Japanned Clothes Line ..... 60&10%
Empire Sash Pulley ..... 55&60%
Moore's Sash, Anti-Friction 50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 ..... 50&10&50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 ..... 50%
Hay Fork, "P" Common and Pat. Bushed 20%
Hay Fork, Tarbox Pat. Iron 20%
Hay Fork, Reed's Self-Lubricating ...60%
Shade Rack 45%
Tackle Blocks ..... See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00. ..... 40%

Pumps—

Cistern, Best Makers ..... 60@60&10%
Pitcher Spout, Best Makers. ...67½@70%
Pitcher Spout, Cheaper Goods. 70@70&5%

Punches—

Saddlers' or Drive, good, ₱ doz...60@65¢
Bemis & Call Co.'s Cast Steel Drive. .50&5%
Bemis & Call Co's Springfield Socket. 50&5%
Spring, good quality ..... ₱ doz $2.50@2.60
Spring, Leach's Pat. 15%
Bemis & Call Co.'s Spring and Check . 40%
Solid Tinners' ..... ₱ doz $1.44, 55%
Tinners' Hollow Punches ..... 20&2%
Rice Hand Punches 15%
Avery's Revolving 40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—

Sliding Door. Wr't Brass, ₱ ℔ 35¢ 15%
Sliding Door, Bronzed Wr't Iron .. ₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door, Light. In. ½ ⅝ ¾
Per 100 feet $2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet ... $2.15 2.70 3.25..net
Terry's Wrought Iron, ₱ foot ..... 4½@5¢
Victor Track Rail, 7¢ ₱ foot ..... 50&2%
Carrier Steel Rail, ₱ foot ..... 4½¢
Moore's Wrought Iron 25%

Rakes—

Cast Steel, Association goods 70%
Cast Steel, outside goods ..... 60&10@70%
Malleable ..... 70@70&5%
Gibbs Lawn Rake ..... $12.00, 50&15%
Canton Lawn Rake ..... $9.00, 50&10%
Ft. Madison Prize Bow Brace and Peerless 65%
Fort Madison Steel Tooth Lawn Rake, $6.00. ..... 25%

Razors—

J. R. Torrey Razor Co 20%
Wostenholme and Butcher, $10.00 to £, 10%

Razor Strops—

Genuine Emerson ..... 60@60&5%
Imitation " ..... ₱ doz $2.00, 20&10&5%
Torrey's 20%
Badger's Belt and Com ..... ₱ doz $2.00
Lamont Combination ..... ₱ doz $4.00

Rivets and Burrs—

Iron, list Nov. 17, '87 ..... 50%
Copper ..... 50&10@60%

Rivet Sets ..... 50&10%

Rods—

Stair, Brass ..... 25&2%
Stair, Black Walnut .. .. ₱ doz 40¢

Rollers—

Barn Door, Sargent's list ..... 60&10&10%
Acme Moore's Anti-Friction 55%
Union Barn Door Roller 70%

Rope—

Manufacturers' prices for large lots:
Manila...⅜ in. and larger ₱ ℔ 13¼¢
Manila ..... ⅜ in. ₱ ℔ 13¾¢
Manila ..... ½ and 5-16 in. ₱ ℔ 14 ¢
Manila Tarred Rope ..... ₱ ℔ 12¾¢
Manila, Hay Rope ..... ₱ ℔ 13¾¢
Sisal...⅜ inch and larger ₱ ℔ 11¼¢
Sisal ..... ⅜ in. ₱ ℔ 11¾¢
Sisal ..... ½ and 5-16 in. ₱ ℔ 12 ¢
Sisal, Hay Rope ..... ₱ ℔ 11¼¢
Sisal, Tarred Rope ..... ₱ ℔ 10¾¢
Sisal, Medium Lathe Yarn. ₱ ℔ 10¾¢
Cotton Rope ..... ₱ ℔ 15¢&18¢ net
Jute Rope ..... ₱ ℔ 8¢

1½% for cash in 10 days.

Rules—

Boxwood ..... .80&10&10@80&10&10&5%
Ivory ..... 50@50&10%
Starrett's Rules and Straight Edges, Steel ..... 25&10%

Sad Irons—

From 4 to 10, at factory ...₱ 100 ℔, $2.40@$2.55
Self-Heating ..... ₱ doz $9.00 net
Self-Heating, Tailors' ... ₱ doz $18.00 net
Gleason's Shield and Toilet. 25%
Mrs. Pott's Irons ..... 40@40&10%
Enterprise Star Irons 40%
Combined Fluter and Sad Iron, ₱ doz, $15.00 ..... 15%
Fox Reversible, Self-Fluter ₱ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England ..... 5¢, 15%
Mahony's Troy Pol. Irons 25%
Sensible ..... 20@20&5%
National Self-Heating ..... 30 %

Sand and Emery Paper and Cloth—

List April 19, 1886 ..... 50@50&10%
Sibley's Emery and Crocus Cloth 30%

Sash Cord—

Common ..... ₱ ℔, 10@11¢
Patent, good quality ..... ₱ ℔ 13¢&13½¢
White Cotton Braided, fair.. ₱ ℔ 28¢@2¢
Common Russia Sash ..... ₱ ℔ 19½¢
Patent " " ..... ₱ ℔ 15¢
Cable Laid Italian Sash.... ₱ ℔ 22¢@23¢
India Cable Laid " ..... ₱ ℔ 13¢

Silver Lake—
A Quality, White, 50¢ ..... 10&10&5%
A Quality, Drab, 55¢. ..... 10&10&5%
B Quality, White, 50¢ ..... 20&10&5%
B Quality, Drab, 55¢ ..... 20&10&5%
C Quality, White (only) ..... 26½¢@28¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab. .39¢
Semper Idem, Braided, White. ..... 30¢
Egyptian, India Hemp, Braided. ..... 25¢

Samson—
Braided, White Cotton, 50¢. .30&30&5%
Braided, Drab Cotton, 55¢ ..30&30&5%
Braided, Italian Hemp, 55¢. .30&30&5%
Braided, Linen, 80¢ ..... 30&30&5%

Sash Locks—

Clark's, No. 1, $10; No. 2, $8 ₱ gr.. .33⅓%
Ferguson's 33⅓%
Morris and Triumph, list Aug. 16, 1886, 60&2%
Victor ..... 60&10&2%
Walker's 10%
Attwell Mfg. Co. ..... 25&33⅓%
Reading ..... 60%&10@66⅔&10&10%
Hammond's Window Springs 40%
Common Sense, Jap'd, Cop'd and Br'zed ..... ₱ gr $4.00
Common Sense, Nickel Plated ₱ gr $10.00
Universal 30%
Kempshall's Gravity 60%
Kempshall's Model ..... 60@60&10%
Corbin's Daisy, list Feb. 15, 1886.. 70%
Payson's Perfect ..... 60@60&10%
Hugunin's Sash Balances ..... 25&5&2%
Hugunin's New Sash Locks ..... 25&5&2%
Stoddard "Practical" 10%
Ives' Patent ..... 60@60&10%
Liesche's, Nos. 100 and 110, ₱ gr $8; 105, $10.00. ..... 20&10%
Davis, Bronze, Barnes Mfg. Co. 50%
Champion Safety, list March 1, 1888 55@55&5%
Security 70%
Buckeye ..... ₱ gro $4.80

Sash Weights—

Solid Eyes ..... ₱ ton $22.00

Sausage Stuffers or Fillers—

Miles' "Challenge," ₱ doz $20, 50&50&5%
Perry ..... ₱ doz, No. 1, $15.00; No. 0, $21.00 ..... 50&5@50&10%
Draw Cut No. 4, each $30.00 ..... 20%
Enterprise Mfg. Co. ..... 20&10@30%
Silver's ..... 40&10%

Saws—

Disston's Circular ..... 45@45&5%
Disston's Cross Cuts ..... 45@45&5%
Disston's Hand 25@25&5%
Atkins' Circular Shingle and Heading 50&10%

Extras sometimes given by jobbers.

Atkins' Silver Steel Diamond X Cuts, ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ₱ foot 30¢
Atkins' Champion and Electric Tooth X Cuts ..... ₱ foot 24@25¢
Atkins' Hollow Back X Cuts. .₱ foot 18¢
Atkins' Mulay, Mill and Drag ..... 40&10%
Atkins' One-Man Saw, with handles, ₱ foot 32¢
W. M. & C., Hand ..... 30&5@30&10%
W. M. & C., Champion X Cuts, Regular ..... ₱ foot 24@26¢
W. M. & C. X Cuts, Thin Back, ₱ foot 27@29¢
Peace Circular and Mill ..... 45&10%
Peace Hand Panel and Rip 20&10@20&10&10%
Peace Cross Cuts, Standard... ₱ foot 25¢
Peace Cross Cuts, Thin Back ₱ foot 27@28¢
Richardson's Circular and Mill 45@45&10%
Richardson's X Cuts, No. 1, 39¢; No. 2, 27¢; No. 3, 24¢

Hack Saws—

Griffin's, complete. ..... 40&10@50%
Griffin's Hack Saw, Blades.... 40&10@50%
Star Hack Saws and Blades 25%
Diamond Hack Saws and Blades 25%
Eureka and Crescent 25%

Saw Frames—

White Vermont ..... ₱ gro $9.00@10.00
Red, Polished and Varnished ..... ₱ doz $1.50, 25%

Saw Sets—

Stillman's Genuine...₱ doz $5.00@7.75, 40&5%
Stillman's Imita. ..... ₱ doz $3.25@5.25, 40&5@40&10%
Common Lever ..... ₱ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00. 40&10@50%
Leach's...No. 0, $8.00; No. 1, $15, 15@20%
Nash's ..... 20&10@20&10&10%
Hammer, Hotchkiss $5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30@5%
Bemis & Call Co.'s Lever and Spring Hammer ..... 30@5%
Bemis & Call Co.'s Plate 10%
Bemis & Call Co.'s Cross Cut 12½%
Aiken's Genuine ..... $13.00, 50&10%
Aiken's Imitation ..... $7.00, 55&5%
Hart's Pat. Lever 20%
Disston's Star, ₱9, No. 15, $5.50; 20& 10@20&10@10%
Atkin's Lever, ₱ doz No. 1, $6.00; No. 2, $9.60
Atkin's Criterion ..... ₱ doz $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00 ..... 40&10%
Avery's Saw Set and Punch 50%
Am. Tool Co.'s Superior ..... ₱ doz $15,50%

Saw Tools—

Atkins' Perfection ..... ₱ doz $15.00
Atkins' Excelsior ..... ₱ doz $6.00
Atkins' Giant ..... ₱ doz $4.00

Scales—

Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Tea, No. 161.... ₱ doz $6.75@$7.00
Union Platform, Plain ..... $2.10@2.20
Union Platform, Striped ..... $2.20@2.30
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka 25%
Chatillon's Favorite 40%
Family, Turnbulls ..... 30@30&10%
Riehle Bros.' Platform 40%

Scale Beams—

Scale Beams, List Jan. 12, '82.. 50&10@ 50&10&5%
Chatillon's No. 1 ..... 40%
Chatillon's No. 2 ..... 50%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $6.50 ..... 30&10%
Box, 1 Handle ..... ₱ doz $4.00, 10%
Box, 2 Handle ..... ₱ doz $6.00, 10%
Defiance Box and Ship ..... 20&10%
Foot ..... 50&10@60%
Ship, Common ..... ₱ doz $3.50 net
Ship, R. I. Tool Co. 10%

Screen Window and Door Frames—

Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons....33⅓@ 33⅓&10%
Stearns' Frames and Corners. 25@25&10%

Screw Drivers—

Douglas Mfg. Co. ..... 20&10&10%
Disston's ..... 45&10%
Disston's Pat. Excelsior ..... 45&10%
Buck Bros. 30%
Stanley R. & L. Co.'s Varnished Handles ..... 65&10% Black Handles. ..... 60&10%
Sargent & Co.'s
No. 1 Forged Blade ..... 60&10&10%
Nos. 20, 30 and 60 ..... 66⅔&10&10%
Knapp & Cowles' No. 1 ..... 60&20&70%
No. 1 Extra ..... 60@60&10%
Nos. 00 & 4 ..... 50&5@50&10&5%
Stearns' ..... 25&10&5%
Gay & Parsons 35%
Champion ..... 25&10%
Clark's Pat. ..... 30@33⅓%
Crawford's Adjustable 30%
Eilrich's Socket and Ratchet. 25@25&10%
Allard's Spiral, new list 25%
Kolb's Common Sense ₱ doz $6.00, 25&10%
Syracuse Screw-Driver Bits....30&30&5%
Screw Driver Bits. ..... ₱ doz 50&75¢
Screw-Driver Bits, Parr's ..... ₱ gro $6.25
Fray's Hol. Hdle. Sets. No. 3, $12.00, 25@25&10%
P. D. & Co.'s all Steel 50%

Screws—

Wood Screws—List March 1, 1889

Flat Head Iron	50%
Round Head Iron	40%
Flat Head Brass	45%
Round Head Brass	35%
Flat Head Bronze	45%
Round Head Bronze	35%

Extra 5 @ 10 % often given

Machine—
Flat Head, Iron.....55%
Round Head, Iron.....50%

Bench and Hand—
Bench, Iron.....55&10@55&10&10%
Bench, Wood, Beech.....₱ doz $2.25
Bench, Wood, Hickory.....20@10%
Hand, Wood.....25&10@25&10&5%
Lag, Blunt Point, according to size.....75&10@80%
Coach and Lag, Gimlet Point.....75%
Bed.....25&5%
Hand Rail, Sargent's.....60%&10%
Hand Rail, H. & B. Mfg. Co...70&10@75%
Hand Rail, Am. Screw Co.....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent...60&10@60&10&5%
Jack Screws Stearns'.....40@40&10%

Scroll Saws—
Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cabinet Makers', $15.....25%
Barnes' Scroll Saw Blades.....35%

Scythe Snaths..50&5&2@50&10&2%

Shears—
American (Cast) Iron...75&10@75&10&5%
Pruning...See Pruing Hooks and Shears.
Barnard's Lamp Trimmers...₱ doz $3.75
Tinners'.....20&2%
Seymour's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears.....33⅓%
First quality C. S. Trimmers..80@80&10%
Second quality C. S. Trimmers. 80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Clauss Shear Co., Japanned.....70%
Clauss Shear Co., Nickeled, same list.60%

Sheaves—
Sliding Door—
M. W. Co., list July, 1888...50&10@60&2%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60&2%
Moore's Anti-Friction.....50%
Sliding Shutter—
R. & E. list Dec. 18, 1885.....60&10&2%
Sargent's list.....60&10%
Reading list.....60&10&10%

Ship Tools—
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phœnix, at factory. $4.00
Mule—
Add $1 ₱ keg to above prices.
Ox, Wrought—
Ton lots.....₱ ℔ 9¢
1000 ℔ lots.....₱ ℔ 9½¢
500 ℔ lots.....₱ ℔ 10¢

Shot—
(*Eastern prices 2¢ off, cash, 5 days.*
Drop, ₱ bag, 25 ℔.....$1.21
Drop, ₱ bag, 5 ℔.....30
Buck and Chilled, ₱ 25-℔ bag.....1.46
Buck and Chilled, ₱ 5-℔ bag.....35

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60@60&10%
Griffith's Solid C. S. R. Goods.....20%
Old Colony (Sanford Fork & Tool Co).20%
St. Louis Shovel Co.....20@20&7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.....20@20&7½%
Lehigh Mfg. Co.....50&10%
Payne Pettebone & Son, list January, 1886.....30%
Remington's (Lowman's Pat.)30@10@40%
Rowland's, Black Iron.....50&10%
Rowland's Steel.....60&5@60&10%

Shovels and Tongs—
Iron Head.....60&10@60&10&5%
Brass Head.....60&10&10%

Skeins, Thimble—
Western list.....75&5@75&10%
Columbus Wrt. Steel, list Nov. 1, 1887.20%
Coldbrookdale Iron Co.....50&10%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Sieves—
Buffalo Metallic, S. S. & Co...50&25&10%
Shaker (Barler's Pat.) Flour Sifters.... ₱ doz $2.00; ₱ gr $21.00
Electric.....₱ gr $18.00
Hunter's.....₱ gr $21.60
Smith's Adjustable Sifters....₱ doz $2.00
Smith's Adjustable Milk Strainer. ₱ doz $2.00
Smith's Adjustable T. & C. Strainer. ₱ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₱ doz..	70¢	90¢
Mesh 20, Nested, ₱ doz..	85¢	$1.00
Mesh 24, Nested, ₱ doz..	$1.00	1.10

Slates—
School, by case.....40%

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&2%
Covert, New Patent.....50&5&2%
Covert, New R. E.....60@10&2%
Covered Spring.....60&10&10%

Soldering Irons—
Covert's Adjustable, list Jan. 1, 1886. 35&2%

Spoke Shaves—
Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....20&10@30%
Cincinnati.....25&10%

Spoke Trimmers—
Bonney's.....₱ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ doz. 55&10%
Douglas'.....₱ doz $9.00, 20%

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp. Co.'s list...70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co.....33⅓&2%
Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers.....50%
C. Rogers & Bros.....50%
Rogers & Bro.....50%
Reed & Barton.....50%
Wm. Rogers Mfg. Co.....50&10@60%
Simpson, Hall, Miller & Co.....50&10
Holmes & Edwards Silver Co...60@60&5%
L. Boardman & Son.....50&10%
Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50&10
No. 49 Nickel Silver.....50&10
German Silver.....50%&50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5&50&10&5% cash
Britannia.....60%
Boardman's Nickel Silver.....50 } 10 mos.
Boardman's Britannia Spoons, case lots.....60 } net
Springs—
Elliptic, Concord, Platform and Half Scroll.....60@60&5%
Cliff's Bolster Springs.....25%

Squares—
Steel and Iron..... } 75&10@80%
Nickel-Plated..... } full cs. ex. 10%
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels.45&10%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Standard Fibre Ware—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.....	$2.00	$2.25
Wash-Basins, 12 in.....	2.25	2.75
Keelers, 11¾ in.....		4.00
Cuspidors.....		8.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.....	4.00	
Half-peck Measure.....	3.50	

See also Pails.

Staples—
Fence Staples, Galvanized. } Same price as B'rb Wire
Fence Staples, Plain..... } See Trd. Rep.

Steelyards.....40&10@50%

Stocks and Dies—
Blacksmith's
Waterford Goods.....30&5@30&10%
Butterfield's Goods.....30&5@30&10%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates....33⅓&5@40%
Reversible Ratchet.....30 %
Gardner.....25%

Stone—
Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone.....₱ ℔ 2½¢
Washita Stone, Extra.....₱ ℔ 19@20¢
Washita Stone, No. 1.....₱ ℔ 14@15¢
Washita Stone, No. 2.....₱ ℔ 10@11¢
Washita Slips, No. 1, Extra..₱ ℔ 36@38¢
Washita Slips, No. 1.....₱ ℔ 24@25¢
Arkansas Stone, No. 1, 4 to 6 in ₱ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in ₱ ℔ $1.85
Turkey Oil Stone, 4 to 8 in.....₱ ℔ 40¢
Turkey Slips.....₱ ℔ $1.00@1.50
Lake Superior, Chase.....₱ ℔ 16¢
Lake Superior Slips, Chase...₱ ℔ 31@32¢
Seneca Stone, Red Paper Brand....₱ ℔ 18@20¢
Seneca Stone, High Rounds..₱ ℔ 20@25¢
Seneca Stone, Small Whets..₱ gro $24.00

Stove Polish—
Joseph Dixon's.....₱ gro $6.00, 10%
Gem.....₱ gro $4.50, 10%
Gold Medal.....₱ gro $6.00, 25%
Mirror.....₱ pro $6.00, —%
Lustro.....₱ gro $4.75
Ruby.....₱ gro $5.75
Rising Sun, 5 gro lots.....₱ gro $5.50
Dixon's Plumbago.....₱ ℔ $5.00
Boynton's Noon Day, ₱ gro.....13.00
Parlor Pride Stove Enamel..₱ gro 3 cans
Yates' Liquid, 2 3 5 10 gal....8¢ ₱ gal ..$0.90 .80 .70 .60
Yates Standard Paste Polish, 10-℔ cans, ₱ ℔ 15¢
Jet Black.....₱ gro $3.50
Japanese.....₱ gro $3.50
Fireside.....₱ gro $2.50
Diamond O. K. Enamel.....₱ gro $19.00
Bonnell's Liquid Stove Polish..₱ gro $9.00
Bonnell's Paste Stove Polish..₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₱ gro $6.00

Tacks, Brads, &c.—
List, Jan. 2, 1888.—[*Note.*—Some manufacturers are selling Tacks at slightly higher prices than those named]:
American Iron Carpet, Blued.....80%
American Iron Carpet, Tinned. 80&10&10%
Steel Carpet, Blued.....80%
Steel Carpet, Tinned.....80&10&10%
Swedes Iron Carpet, Blued.....80%
Swedes Iron Carpet, Tinned..80&10&10%
American Iron Cut.....75@75&10&5%
Swedes Iron.....75&5@75&10&5%
Swedes Iron, Upholsterers', 75&10@80%
Tinned Swedes Iron.....75&10@80%
Tinned Swedes Iron, Upholsterers', 75&10@80%
Gimp and Lace.....75&10&80%
Tinned Gimp and Lace.....75&10&80%
Swedes Iron Trimmers'.75&10@75&10&5%
Swedes Iron Miners'...75&10@75&10&5%
Swedes Iron Bill Posters' or Railroad, 75&10@75&10&5%
Swedes Steel (Swedes Iron price list), 80@80&5%
Copper Tacks.....50&10%
Copper Finishing, Trunk and Clout Nails.....50&10%
Finishing Nails.....75@75&5%
Trunk and Clout Nails.....70&10%
Tinned Trunk and Clout Nails....70&10%
Basket Nails.....70&10%
Common and Patent Brads.....70&10%
Hungarian Nails.....70&10%
Chair Nails.....70&10%
Zinc Glaziers' Points.....50@50&5%
Cigar Box Nails.....50&10@50&10&5%
Picture-Frame Points...50&10@50&10&5%
Looking Glass Tacks...50&10@50&10&5%
Leathered Carpet.....50&10@50&10&5%
Brush Tacks.....50&10@50&10&5%
Shoe Finders,' List Jan. 2, 1888, 10@10@ 10&10&5%
Lining and Saddle Nails, List Jan. 1, 1886:
Silvered.....30&10&10%
Japanned.....20&10&10%
Double-Pointed Tacks.....85%
Wire Carpet Nails.....50&10%
Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tap Borers—
Common and Kind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10@30%
Clark's.....33⅓@35%

Tapes, Measuring—
American.....33⅓@33⅓&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—
Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale- Steel
Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—
Shears and Snips (P. S. & W.).....20@25%
Punches, see Punches.
Snips, J. Mallinson & Co.....33⅓%

Tinware—
Stamped, Japanned and Pierced, list Jan. 20 1887.....75@75&5

Tire Benders, Upsetters, &c—
Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Tobacco Cutters—
Champion.....20&10@30%
Wood Bottom.....₱ doz $5.00@$5.25
All Iron.....₱ doz $4.25
Nashua Lock Co.'s ₱ doz, $18.00 50@55%
Wilson's.....55%
Sargent's.....₱ doz, $24, 55&10%
Acme.....₱ doz. $20.00,40%

Transom Lifters—
Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Jan. 1, 1887-
Bronzed Iron Rods.....50&10&2
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's Universal.....40@40&10%

Traps—
Game—
Newhouse.....40@40&5%
Onedia Pattern.....70@70&10%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood, Choker, ₱ doz holes, 11@12¢
Mouse, Round Wire.....₱ doz $1.50, 10%
Mouse, Cage, Wire.....₱ doz $2.50, 10%
Mouse, Catch-'em-alive....₱ dz $2.50, 15%
Mouse, Bonanza.....₱ gr $10.00
Mouse Delusion.....₱ gr $15.00
Rat, Decoy.....₱ gr $10.00, 10%
Ideal.....₱ gr $10.00
Cyclone.....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz 90¢
In full cases.....₱ doz 75¢

Trowels—
Lothrop's Brick and Plastering.25@25&5%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering, 25@25&10%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Bradel's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Triers—
Butter and cheese.....25%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ½ ℔ Balls.....	22¢	30¢
No. 12, ¼ and ½ ℔ Balls.....	21¢	29¢
No. 18, ¼ and ½ ℔ Balls.....	18¢	28¢
No. 24, ¼ and ½ ℔ Balls.....	18¢	28¢
No. 36, ¼ and ½ ℔ Balls.....	16¢	27¢

No. 264, Mattrass, ¼ and ½ ℔ Balls.48@50¢
Chalk Line, Cotton, ½ ℔ Balls.....25¢
Mason Line, Linen, ½ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine).....11½¢
3-Ply Hemp, 1 ℔ balls.....12¢@12½¢
3-Ply Hemp, 1½ ℔ Balls.....11¢@11½¢
Cotton Wrapping, 5 Balls to ℔ ..15¢@16¢
2, 3, 4 and 5-Ply Jute, ½ ℔ Balls.....10¢
Wool.....6½¢@6¾¢
Paper.....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to doz..18¢

Vises—
Solid Box.....60@60&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60@10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓&35%
Sargent's.....60%&10%
Hopkins'.....₱ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Combination Hand Vises.....₱ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....20&10%

Wagon Boxes—
Per ℔.....2½¢

Wagon Jacks—
Daisy.....25%

Washer Cutters—
Smith's Pat.....₱ doz $12.00, 20&10&10%
Johnson's.....₱ doz $11.00, 33⅓%
Penny's, ₱ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₱ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Washers—

Size.....	½	5-16	⅜	½	⅝	¾	1
Washers....	6½	5½	4½	3½	3	3	3

In lots less than 200 ℔, ₱ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—
Iron.....₱ ℔ 3½¢
Steel.....₱ ℔ 4 ¢

Well Buckets, Galvanized—
Hill's.....₱ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₱ doz, 14 qt, $4.25@$4.50
Whiting's Flat Iron Band.....$4.25@4.50
Whiting's Wired Top..₱ doz $4.00@.4.25

Well Wheels—
8 in., $2.25; 10 in., $2.75; 12 in., $3.25

Wire—
Iron—
Market,
Br. & Ann., Nos. 0 to 18....75@75&10%
Cop'd, Nos. 0 to 18.....70@70&10%
Galv., Nos. 0 to 18.....25&10%
Tin'd, Tinned list Nos. 0 to 18.....70%
Stone,
Br. and Ann'd, Nos. 16 to 18, 72½@ 75@75&5%
Bright and Ann'd, Nos. 19 to 26, 75@ 75&10%
Br. and Ann'd, Nos. 27 to 36.....80%
Tinned.....70&10@75%
Tinned Broom Wire.....70&10@75%
Galvanized Fence.....65&5%
Annealed Fence, Nos. 8 and 9.....75&5%
Annealed Grape, Nos. 10 to 14 .....75&5%
Brass, list Jan. 18, 1884.....25@30%
Copper, list Jan. 18, 1884.....30 @ 35%
Barb Fence.....See Trade Report
Wire on Spools.....65%
Malin's Steel and Tin'd Wire on Spools, 60%
Malin's Brass and Cop. Wire on Spools50%
Cast Steel Wire.....50%
Stubs' Steel Wire .....$6.00 to $. 30
Steel Music Wire, Nos. 12 to 30..55¢ ₱
Picture Wire.....New list, 50%
Barb Wire Safety Guards, ₱ 1000, $9.00, 25%
Wire Clothes Lines, see Lines.

Wire Cloth, Netting, &c.
Painted Screen Cloth, good quality, ₱ 100 sq. ft., $1.80 @ $1.90
Galvanized Wire Netting . ....75@75&5%

Wire Goods—
See Bright Wire Goods.

Wire Rope—
List May 1, 1886.
Iron.....30%
Cast Steel.....40%

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....55&3%
Coes' "Mechanics".....55&10&3%
Girard Standard.....70&10%
Machinists', Sterling Wrench Co..70&10%
Lamson & Sessions' Engineers'...60&10%
Lamson & Sessions' Standard.....70&10%
Goes' Pattern, Wrought..... } 75&10&5 @ 80%
Girard Agricultural..... } 75&10&5 @ 80%
Lamson & Sessions' Agric'l.. } 75&10&5 @ 80%
Sterling Wrought..... } 75&10&5 @ 80%
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₱ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....60&3%
Acme, Nickeled.....50&3%
Walker's.....55&3%
Diamond Steel.....55&3%

Wringers, Clothes—
List March 11, 1889, 2% cash.

Wrought Goods—
Staples, Hooks, &c., list Jan. 12, 1886, 80&20@80&25%

CURRENT METAL PRICES.

SEPTEMBER 25, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron :	
¾ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in.....	₩ lb 1.90 @ .. ¢
Refined Iron :	
¾ to 2 in. round and square.. 1 to 4 in. x ⅜ to 1½ in..... 4½ to 6 in. x ⅜ to 1 in.....	₩ lb 2.00 @ 2.10¢
1 to 6 in. x ¼ and 5-16	₩ lb 2.20 @ 2.30¢
Rods—⅝ and 11-16 round and sq..	₩ lb 2.10 @ 2.20¢
Bands—1 to 6 x 3-16 to No. 12.....	₩ lb 2.20 @ 2.30¢
"Burden Best" Iron, base price..	₩ lb 3.00 @ ....¢
Burden's "H. B. & S." Iron, base price.....	₩ lb 2 80 @ ....¢
"Ulster".....	₩ lb 3.00 @ ....¢
Norway Rods	4.00 @ 5.00¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.....	2½¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots.....	5¢

Sheet Iron from Store.

	Common American.	R. G. Cleaned.
10 to 16.....	₩ lb 2.75 @ 2.80¢	3.25 @ .....¢
17 to 20	₩ lb 2.85 @ 3 00¢	3.25 @ 3.50 ¢
21 to 24.....	₩ lb 3.00 @ 3.10¢	3.50 @ .....¢
25 and 26....	₩ lb 3 20 @	3.50 @ .....¢
27.....	₩ lb 3.35 @ 3.37½¢	3.75 @ .....¢
28.....	₩ lb 3.50 @ ..¢	4.00 @ .....¢
	B. B.	2d qual.
Galv'd, 14 to 20, ₩ lb, 4.50 @		4.38 @ .....¢
Galv'd, 21 to 24, ₩ lb, 4.87½ @		4.75 @ .....¢
Galv'd, 25 to 26, ₩ lb, 5 25 @		5.12 @ .....¢
Galv'd, 27.....	₩ lb, 5.62½ @	5.48 @ .....¢
Galv'd, 28.....	₩ lb, 6 00 @	5.85 @ .....¢
Patent Planished.....	₩ lb A 10¢	B, 9¢
Russia.....	₩ lb 9½¢ @ 10¢	
American Cold Rolled B. B.....	₩ lb 5¢ @ 7¢	
Craig Polished Sheet Steel..	₩ lb, 8¢	

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged, Cast.....	₩ lb 16 ¢
Best Double Shear.....	₩ lb 15 ¢
Blister, 1st quality.....	₩ lb 12 ¢
German Steel, Best.....	₩ lb 10 ¢
2d quality.....	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality.....	₩ lb 15 ¢
2d quality.....	₩ lb 14 ¢
3d quality.....	₩ lb 12½¢

METALS.

Tin.

	Per lb
Banca, Pigs.....	23 ¢
Straits, Pigs.....	23 ¢
English, Pigs.....	22½¢
Straits in Bars...	23¼¢

Tin Plates.

Charcoal Plates.—Bright.

		Per box.
Melyn Grade.....IC, 10 x 14..	@	$6 00
" " ....IC, 12 x 12..	@	6.25
" " ....IC, 14 x 20..	@	6.00
" " .....IC, 20 x 28..	@	12.50
" " ....IX, 10 x 14..	@	7.50
" " ....IX, 12 x 12..	@	7.75
" " .....IX, 14 x 20..	@	7.50
" " .....IX, 20 x 28..	@	15 50
" " .....DC, 12½ x 17..	@	5.75
" " .....DX, 12½ x 17..	@	7.25
Allaway Grade.....IC, 10 x 14..	@	5.12½
" " ....IC, 12 x 12..	@	5.25
" " .....IC, 14 x 20..	@	5.12½
" " .....IC, 20 x 28..	@	....
" " .....IX. 10 x 14..	@	....
" " .....IX, 12 x 12..	@	....
" " .....IX, 14 x 20..	@	...
" " .....IX, 20 x 28..	@	....
" " ....DC, 12½ x 17..	@	5.00
" " ..DX, 12½ x 17..	@	6.00

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20..	@	$5.00
10 x 20..	@	7.50
20 x 28..	@	10.25
IX, 10 x 14, 14 x 20..	@	5.75
BV Grade.—IC, 10 x 14, 14 x 20..	@	4.60

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20..	@	$4.62½
20 x 28.....	@	9.25
IX, 14 x 20.....	@	5.62½
20 x 28.....	@	11.37½
Abecarne Grade.—IC, 14 x 20....	@	4.50
20 x 28 ...	@	9.00
IX, 14 x 20 ...	@	5.50
20 x 28...	@	10.80

Tin Boiler Plates.

IXX, 14 x 26.....112 sheets.	.....	$12.50 @ $12.75
IXX, 14 x 28..... 112 sheets....		12 75 @
IXX, 14 x 31 .....112 sheets		14.25 @

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

Ingot.

Lake	@ 12 ¢
Anchor" Brand...	@ 12 ¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, May 23, 1889, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		20	20	20	21	22	23	26	28
30		72	20	20	20	21	23	25	29	....
36	96		20	20	20	22	24	28	30	....
36		96	20	20	21	23	25	29	31	....
48	96		20	20	22	24	26	30	....	....
48		96	20	20	23	25	27	31	....	....
60	96		20	20	25	27	32	....	....	....
60		96	20	21	26	....	....	....	....	....
84	96		21	22	....	....	....	....	....	....
84		96	22	23	....	....	....	....	....	....
Over 84 in. wide			23	25	....	....	....	....	....	....

All Bath Tub Sheets..... 16 oz. 14 oz. 12 oz. 10 oz.
Per pound..... 20c.3 0.25 0.27 0 30
Bolt Copper, ¾ inch diameter and over, per pound..... .20¢
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier.....	23¢
12 ounce and up to 14 ounce to square foot.....	24¢
10 ounce and up to 12 ounce.....	26¢

Circles less than 8 inches diameter 2 cents per pound additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each.....	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each.	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	13¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each.....	12¢
Tinning sheets on one side, other sizes, per square foot.....	2½¢
For tinning both sides double the above prices.	

Planished Brass and Copper.

14 x 48.

14 and 16 oz. and heavier..31¢. By the case...30¢ ₩ lb	
12 oz. and lighter.....33¢. By the case...32¢ ₩ lb	

24 x 48 and 30 x 60.

14 and 16 oz. and heavier..44¢. 12 oz.....	37¢ ₩ lb

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅝	½	⅜	¼	⅞	1	1½
8-14	6-12	35	31	28	27	26	25	22
15	13	36	31	29	28	27	26	23
16	14	37	32	30	29	28	27	23
17	15	38	33	31	30	29	28	24
18	16	40	34	32	30	29	28	25
19	17	41	35	33	32	31	30	27
20	18-19	42	37	35	34	33	32	29
21	20	44	39	37	36	35	34	32
22	21	46	40	38	37	36	35	34
23	22	48	42	40	39	38	37	37
24	23	51	44	42	41	39	38	39
25	24	54	47	44	43	42	41	43

Copper, Bronze and Gilding Tube, 2¢ ₩ lb additional.

Brazed Brass Tubing. (No No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch.....	45¢
Plain, 5-16 inch.....	45¢
Plain, ¼ inch.....	60¢
Plain, 3-16 inch.....	$1.00
Plain, ⅛ inch.....	1.50
Fancy Tubing, Brass, to No. 20, inclusive.....	43¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list.....	25 @ 30 %

Roll and Sheet Brass.

Discount from list..... 25 @ 30 %

High Brass Rods.

Over 1 inch diameter..	27¢
¼ inch to 1 inch diameter, both inclusive.....	24¢
No. 8 and less than ¼ inch diameter.....	26¢
Smaller than No. 8.....	30¢
Hexagon, Octagon and Square, 2¢ ₩ lb advance over Round Rods.	

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	5¾¢ @ 6¢
"Bergenport".....	.8¢
"Bertha"	.....7¾ @ 8¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.

600 lb casks	6½¢
Per lb	7¼¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.

American	4½¢
Newark	4¾¢
Bar.....	4½¢
Pipe, subject to trade discount....	6 ¢
Tin-Lined Pipe, subject to trade discount....	15¢
Block Tin Pipes, subject to trade discount.....	45¢
Sheet, subject to trade discount.....	6¾¢

Solder.

½ @ ½ (Guaranteed)...	14½¢
Extra Wiping	12½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson.....	₩ lb 19½¢
Hallett's	" 17½¢

Fittings.

Cast Iron Fittings, Black and Galvanized.	.....75&10 %
Cast Iron Fittings, Bushings and Plugs	.....80 %
Cast Iron Fittings, Flanges	.....75&10 %
Malleable Iron Bushings	.....80@80&5 %
Malleable Iron Unions	.....70@70&5 %
Malleable Iron American Unions	.....55 %
Malleable Iron Unions, Keystone	.....55 %
Wrought-Iron Nipples	.....75&10 %
Wrought-Iron Couplings	.....70 %
Wrought-Iron Long Screws	.....70@70&5 %
Casing Fittings	.....60 %
Malleable Iron Fittings	.....40@40&5 %

Valves, Cocks, &c.

Iron Body Valves	.....70 %
Throttle Valves, Iron Body	.....70 %
All-Iron Valves	.....65 %
Compression Gauge Cocks	.....60 %
Mississippi Gauge Cocks	.....60 %
Register Gauge Cocks	.....65@65&10 %
Air Cocks and Radiator Air Cocks	.....65@65&10 %
Steam Gauge Cocks	.....60 %
Oil Cups, Plain, Elbow, new pattern, T and Lever Handle	.....65@65&10 %
Globe Oil Cups	.....55 %
Common Lubricators	.....65@65&10 %
Lubricators with Air Cocks.	.....65@65&10 %
Iron Body Lubricators	.....60 %
Steam Whistles	.....65 %
Whistle Valves	.....65 %
Water Gauges	.....65 %
Brass Expansion Joints	.....55 %
Pump Valves	.....55 %
Soldering Unions	.....65 %
Soldering Nipples	.....65 %
Brass Unions (Union Joints)	.....65 %
Radiator Nipples	.....6 %
Fusible Plugs	.....60 %
Oil Pumps	.....55 %
Self-Acting Air Valves	.....55 %
Vacuum Valves	.....55 %
Steam Swing Joints	.....55 %
Iron Strainers	.....55&10 %
Jenkins' Iron Body Valves, except Gate Valves	.60&10 %
Jenkins' All-Iron Valves, except Gate Valves	.....60 %
Jenkins' Iron Body Gate Valves	.....55 %
Jenkins' All-Iron Gate Valves	.....55 %
Iron Cocks, all Iron	.....65 %
Iron Cocks, with Brass Plugs	.....65 %
Brass Globe, Angle and Cross Valves	.....65 %
Brass Globe Valves, Finished	.....45 %
Brass Globe and Angle Valves, hose outlet	.....65 %
Brass Garden Hose Valves	.....65 %
Brass Caps for Hose Valves	.....60 %
Brass Horizontal, Vertical and Angle Check Valves	.65 %
Brass Safety Valves	.....65 %
Brass Safety Valves, low pressure	.....65 %
Brass Safety Valves, low pressure, with balance weight	.....65 %
Brass Butterfly Valves	.....55 %
Brass Throttle Valves	.....55 %
Brass Radiator Valves	.....65 %
Brass Radiator Valves, Jenkins'	.....65 %
Brass Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves	.....65 %
Brass Jenkins' Gate Valves	.....50 %
Brass Steam Cocks	.....60 %
Brass Gas, Meter and Union Meter Cocks	.....60 %
Brass Fittings, Rough	.....60 %
Brass Fittings, Finished	.....25 %
Brass Bushings	60

Plumbers' Brass Work.

Ground Key Work, Rough	.....60 %
Ground Key Work, Finished	.....55 %
Compression Work	.....60@60&5 %
Compression Work, Grundy, Heavy Pattern	.....55 %
Chain Stays	.....60 %
Basin Plugs	.....60 %
Sink or Bath and Wash Tray Plugs	.....60 %
Basin Clamps	.....55 %

FRENCH GLASS.

Per Box 50 feet.

Sizes	Single. 1st.	2d.	3d.	4th.
	E F H	I E H	H H	H B
25 6 x 8 to 10 x 15.....	$10.50	$9.00	$8.50	$8.00
40 11 x 14 to 16 x 24	11.50	10.75	10.25	9.75
50 18 x 22 to 20 x 30.....	15.50	14.00	13.00	12.50
54 15 x 36 to 24 x 30.....	16.50	15.00	13.50	....
60 26 x 28 to 24 x 36.....	17.75	16.25	14.75	.....
70 26 x 36 to 26 x 44.....	19.00	17.50	15.25	.....
80 26 x 46 to 30 x 50.....	21.00	19.50	17.00	....
84 30 x 52 to 30 x 54.....	22.00	20.25	18.00	.....
90 30 x 56 to 34 x 56.....	23.00	21.25	19.00	.....
94 34 x 58 to 34 x 60.....	24.00	22.75	21.00	....
100 36 x 60 to 40 x 60	26.50	24.50	23.00	....